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SUGAR BULLETIN No. 6.

FIELD EXPERIMENTS WITH SUGAR CANE, VI.

BY

C. HOLMAN B. WILLIAMS,
Sugar Agronomist,

R. R. FOLLETT-SMITH,
Chemist-Ecologist,

AND

C. CAMERON,
Field Manager.

WITH

A FOREWORD

BY

PROFESSOR J. SYDNEY DASH,
Director of Agriculture.

THE "DAILY CHRONICLE," GEORGETOWN, DEMERARA,
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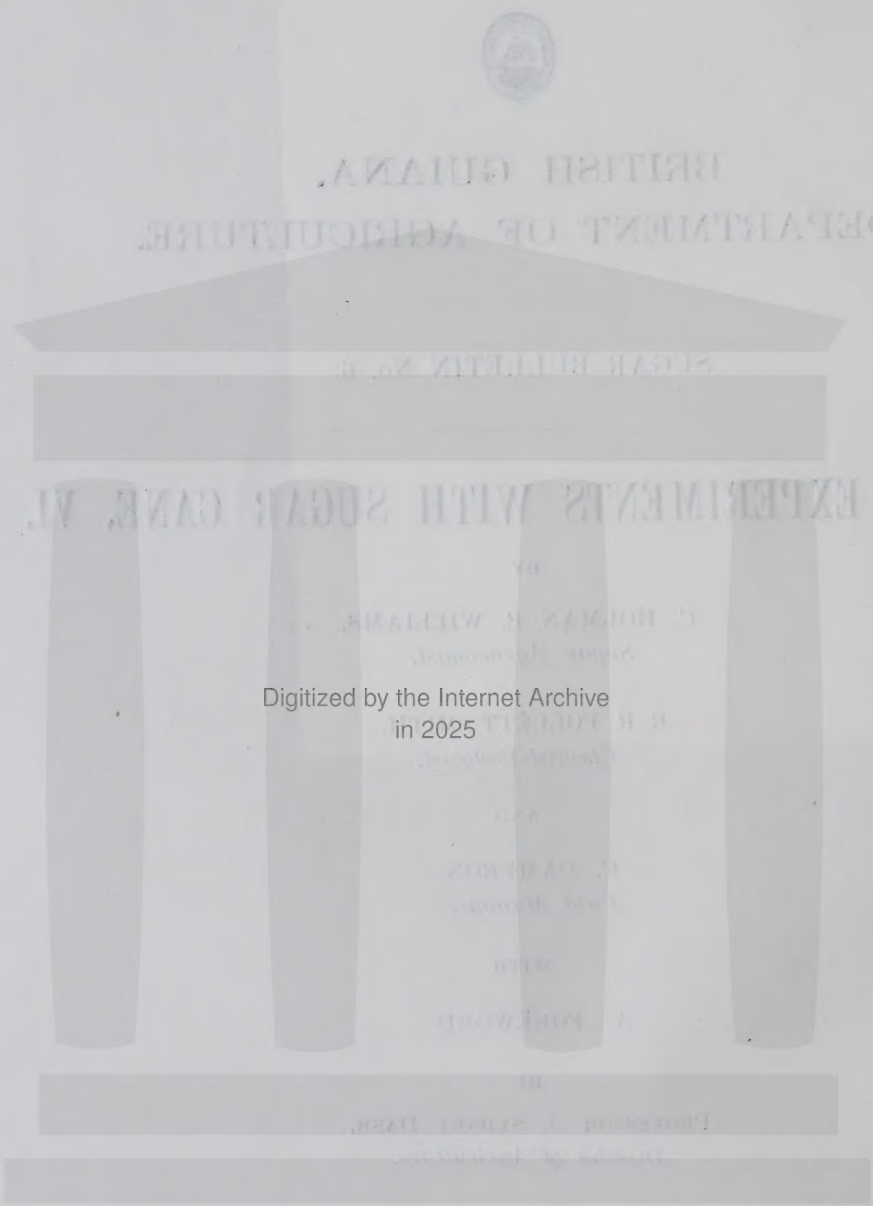

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FOREWORD.

The results of recent investigations undertaken on behalf of the major industry of the Colony are presented in *Sugar Bulletin* No. 6, issued by the Department of Agriculture. The subject matter is dealt with in three parts: Variety Trials, Manurial Trials and Flood-fallowing Trials.

The work with varieties while finally clarifying the position in respect to the older varieties which had been insufficiently tested at the time of the reorganisation of the Sugar Station, has served further to emphasise the value of the varieties P.O.J. 2878 and Diamond 10 which are rapidly replacing D. 625. It is significant that in the Introductory Note to *Sugar Bulletin* No. 1, the writer stated that this variety, bred in 1892, still occupied 90 per cent. of the cane area; in *Sugar Bulletin* No. 4, it was recorded as occupying 60 per cent. of the cane area, while the figure is now 33 per cent.

With respect to the newer varieties, it is pleasing to note that several seedlings, bred at the Sugar Station in 1930, are now passing through the final stages of ratoon trials and have already secured some recognition by small scale commercial trials on certain estates. Still later ones are being multiplied in nurseries with a view to replicated tests. The variety position, therefore, may be said to be satisfactory, Meanwhile, 1936 proved another good year from the point of view of sugar production; returns per acre are still on the upward trend, being on the average 3.12 tons per acre for all categories of cane reaped on the sugar estates.

The extension of the manurial trials, made possible by financial assistance from Imperial Chemical Industries, London, and Messrs. Booker Bros. McConnell & Co., Ltd., is helping gradually to clarify many of the problems under investigation in respect to the use of nitrogenous fertilizers, while the more recent work undertaken with phosphates and potash, especially in their interactions with nitrogen, point the way to benefits from the moderate use of these fertilizers under certain soil conditions. No finality has been reached and the results, in this connection, must be regarded as suggestive rather than conclusive, until further trials have been reaped. The whole position has been very thoroughly dealt with in the section devoted to manures and manuring.

New light is being shed on the problem of soil acidity which has been assuming increasing importance in recent years and especially with the increased use of sulphate of ammonia. If this tendency in the Colony's sugar lands is to be checked, some liming programme seems essential and the indications are that at least one ton of lime or limestone per acre should be applied at planting—that

is, once in three or four years depending on the length of crop cycle. This point is being stressed more as an insurance than as likely to yield an immediate cash return, though there are indications that liming *before* flooding is responsible for increased yields. Those concerned are urged to pay unremitting attention to this question.

While the results from flood-fallowing investigations have been suggestive, this phase of the work under review is handicapped by restricted facilities. Flood-fallowing experiments are expensive to lay down and unless the estates themselves undertake more trials, systematically planned and run in co-operation with the Department, some time must elapse before the economics of flood-fallowing can be fully elucidated. I would earnestly appeal to all attorneys and managers to assist in this very important work.

J. SYDNEY DASH,
Director of Agriculture.

FIELD EXPERIMENTS WITH SUGAR CANE, VI.

BY

C. HOLMAN B. WILLIAMS, *Sugar Agronomist,*

R. R. FOLLETT-SMITH, *Chemist-Ecologist,*

AND

C. CAMERON, *Field Manager.*

INTRODUCTION.

Forty-eight variety, twenty-one manurial and two flood-fallowing trials, reaped during the year ended June 30, 1937, are reported on in this Bulletin, the sixth of the series. *Sugar Bulletin* No. 1 contained a description of the methods used in carrying out the experiments.

Weather conditions were, on the whole, favourable for the tests reaped in the latter half of 1936, but the Spring crop of 1937 was adversely affected by the early onset of the mid-year rains of 1936, the drought in the Autumn of that year, and another drought in the Spring of 1937.

Cordial appreciation of the courtesy and co-operation extended by the Managers and Staffs of the sugar estates is again expressed.

VARIETY TRIALS.

The variety trials are considered under four sub-sections, *viz.*,

(a) Plant cane variety trials,

(b) First ratoon variety trials,

(c) Second and third ratoon variety trials,

(d) Discussion and summary.

In Appendix I will be found tables comparing the monthly rainfall recorded at each trial site during the progress of the experiments with the mean monthly rainfall experienced there during preceding years; the variations from the monthly normals are there indicated for each trial.

Soil and subsoil samples from the various sites have been examined in the laboratory. The results of the analyses will be found in Appendix II.

SUB-SECTION A.—PLANT CANE VARIETY TRIALS.

Plant Cane Variety Trials Reaped at Sophia Sugar Experiment Station.

Table I presents a list of the plant cane variety trials reaped at the Sophia Sugar Experiment Station during the period under review.

TABLE I.— **Plant Cane Variety Trials Reaped at Sophia Experiment Station.**

Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
		Planting.	Reaping.	Varieties.	Replicates.	
1 East A	11.25	18.IV.36	23.III.37	5	5	Randomised Blocks.
1 „ B	11.25	18.IV.36	23.III.37	5	5	Latin Square.
1 „ C	11.25	18.IV.36	23.III.37	5	5	„
1 „ D	11.00	25.IV.36	23.III.37	4	5	Randomised Blocks.
2 „	15.00	11.VI.35	10.IX.36	18	6	„
8 „ A	14.75	17.VIII.35	10.XI.36	10	7	„
8 „ B	14.75	17.VIII.35	10.XI.36	10	7	„
9 „ A	12.25	4.XII.35	9.XII.36	11	5	„
9 „ B	12.25	4.XII.35	9.XII.36	5	5	„
9 „ C	12.00	11.XII.35	9.XII.36	6	5	„
10 „ A	13.00	18.II.36	17.III.37	7	7	„
10 „ B	12.75	22.II.36	17.III.37	8	5	„
3 West	15.00	21.VI.35	21.IX.36	11	8	„
15 „	15.50	22. V. 35	4.IX.36	10	6	„

Sophia—Field 1 E.—Plant Canes.

The data from the four trials in Field 1 E., Sophia, are presented inTable II and Figure I.

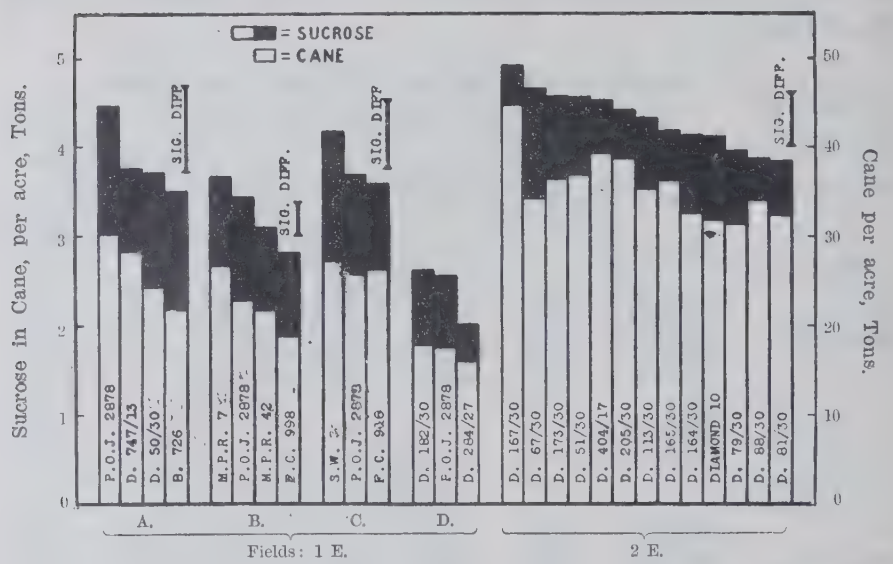
TABLE II.—Results of 4 Variety Trials in Field 1 East, Sophia.

PLANTS, 11.25 months. (Expt. D, 11.00 months).

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.
			Experiment A.				
MEAN YIELDS:	P.O.J. 2878	30.31	14.72	7.09	86.8	4.47	123.14
	D. 747/13	28.42	13.15	12.77	84.5	3.76	103.58
	D. 50/30	24.35	15.17	7.24	88.8	3.72	102.48
	B. 726	21.76	16.04	5.18	90.1	3.51	96.69
	D. 219/30	19.23	14.12	8.64	85.7	2.71	74.66
	Mean:					3.63	100.00
	Standard Error:					0.33	9.09
	Significant Difference, 20: 1:					0.99	27.27
			Experiment B.				
MEAN YIELDS:	M.P.R. 7	26.56	13.82	8.35	86.3	3.68	117.95
	P.O.J. 2878	22.92	15.05	7.11	87.7	3.45	110.58
	M.P.R. 42	21.65	14.48	7.45	88.3	3.11	99.68
	F.C. 998	18.92	15.02	6.26	89.3	2.84	91.03
	P.R. 803	19.62	12.75	7.50	85.6	2.52	80.77
	Mean:					3.12	100.00
	Standard Error:					0.13	4.17
	Significant Difference, 20: 1:					0.40	12.82
			Experiment C.				
MEAN YIELDS:	S.W. 3	27.40	15.19	3.95	88.9	4.19	118.70
	P.O.J. 2878	25.86	14.41	7.10	87.4	3.70	104.82
	F.C. 916	26.42	13.46	7.17	85.1	3.60	101.98
	P.R. 807	22.95	13.67	7.69	86.1	3.17	89.80
	M.P.R. 49	21.83	13.55	8.29	86.7	2.97	84.14
	Mean:					3.53	100.00
	Standard Error:					0.26	7.37
	Significant Difference, 20: 1:					0.80	22.66
			Experiment D.				
MEAN YIELDS:	D. 182/30	17.86	14.81	8.45	86.2	2.64	116.30
	P.O.J. 2878	17.52	14.59	7.75	87.0	2.57	113.22
	D. 284/27	16.05	12.52	21.60	74.5	2.02	88.99
	D. 57/27	14.10	13.45	15.10	79.9	1.87	82.38
	Mean:					2.27	100.00
	Standard Error:					—	—
	Significant Difference, 20: 1:					—	—

FIG. I.

Sucrose and Cane Yields from Plant Canes at Sophia.



This field was harvested during the Spring crop of 1937 and, like similarly timed fields in most parts of the Colony, was adversely affected by unseasonable weather. The yield of cane was somewhat low but, in spite of an early harvest for plant canes, the purities and sucrose contents were satisfactory.

In Experiment A, no variety came near P.O.J. 2878. D. 747/13 and D. 50/30 have competed successfully against the old standard, D. 625, in several trials but it is doubtful if they will surpass P.O.J. 2878.

In Experiment B, M.P.R. 7 (parents : P.O.J. 2725 x S.C. 12/4) showed up well. It will be tested further. This experiment and the one at 39 V., Wales, suggest that M.P.R. 42 (parents : P.O.J. 2725 x S.C. 12/4) will give about the same plant cane yield as P.O.J. 2878, with a somewhat poorer juice.

Of the canes in Experiment C, S.W. 3 (parents : Zwart Cheribon x Batjan) and F.C. 916 (parents : P.O.J. 2725 x S.C. 12/4) deserve further consideration. The former has already given good results at Sophia, and was included in this test so that some confirmation of its behaviour might be obtained. Its ratooning in a previous trial was disappointing and nothing more can be said until the ratoons of this experiment are reaped. F.C. 916 came just under Diamond 10 as a plant cane in Field 3 W., Sophia.

D. 182/30 (parents ; B. 6835 x D. 625), which heads the list in Experiment D, has shown some promise in other trials.

This field, planted at the beginning of the 1936 mid-year wet season, experienced three months of heavy rain immediately after planting. The next four months were, however, unusually dry. Rainfall was excessive during the eighth and ninth months of growth, but very deficient during the tenth and eleventh months, just prior to harvest.

The topsoil of Field I E., Sophia, is a slightly acidic clay overlying an alkaline heavy silt. The organic matter content is below the average and the carbon : nitrogen ratio is normal. The salinity of the topsoil is fairly high, that of the subsoil high. The theoretical lime requirement is above the average.

Sophia—Field 2 E.—Plant Canes.

The results from the trial in Field 2 E., Sophia, are shown in Table III and Figure I.

TABLE III.—**Results of a Variety Trial in Field 2 East, Sophia.**

PLANTS, 15.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS :	D. 167/30	44.82	10.99	11.55	81.4	4.93	120.54
	D. 67/30	34.28	13.61	6.23	87.0	4.66	113.94
	D. 173/30	36.44	12.63	8.21	86.2	4.59	112.22
	D. 51/30	36.94	12.40	10.81	84.8	4.58	111.98
	D. 404/17	39.27	11.49	11.03	82.5	4.53	110.76
	D. 205/30	38.69	11.45	8.93	85.0	4.43	108.31
	D. 113/30	35.27	12.39	8.72	84.6	4.34	106.11
	D. 165/30	36.24	11.61	10.38	84.3	4.20	102.69
	D. 164/30	32.53	12.77	8.16	84.7	4.15	101.47
	Diamond 10	31.80	13.00	8.02	85.7	4.12	100.73
	D. 79/30	31.36	12.67	9.29	84.0	3.97	97.07
	D. 88/30	34.02	11.39	13.71	81.8	3.89	95.11
	D. 81/30	32.38	11.89	9.55	84.1	3.85	94.13
	D. 103/30	32.53	11.63	7.80	82.9	3.76	91.93
	D. 84/30	30.16	12.30	11.43	83.2	3.70	90.46
	D. 171/29	34.54	10.56	11.43	81.1	3.64	89.00
	D. 87/27	29.64	10.69	12.95	79.7	3.15	77.02
	D. 78/30	31.15	10.05	20.02	76.9	3.12	76.28
	Mean :					4.09	100.00
	Standard Error :					0.22	5.38
	Significant Difference, 20 : 1 :					0.64	15.65

D. 167/30 (parent : D. 145), which heads the list has done well in several experiments. It was, however, very disappointing in Field 10 E., Sophia, Experiment A. D. 67/30 (parents : Diamond 10 x S.C. 12/4) has maintained a high position and shown excellent juice qualities in all the three plant cane trials in which it has appeared and can, it seems, be counted on to outyield Diamond 10

and P.O.J. 2878 as a plant. Its ratooning power is now being tested. In Field 76 A., Lusignan, D. 173/30 (parent : D. 145), though somewhat inferior to Diamond 10, gave a satisfactory yield. D. 51/30 (parents : D. 625 x S.C. 12/4) and D. 404/17 (parent : D. 721), though doing well at times, are not consistent and cannot be recommended. Other results from D. 205/30 (parents : B. 6835, x D. 625), D. 113/30 (parents : D. 238/17 x S.C. 12/4), and D. 164/30 (parent : D. 145) have been encouraging.

Rainfall may be considered as having been satisfactory during most of the growth period. It was, however, somewhat deficient at the seventh, ninth and fifteenth months and excessive from the tenth to the twelfth.

The topsoil of Field 2 E., Sophia, is a markedly acidic clay overlying a similar subsoil. The organic matter content of the topsoil is normal, that of the subsoil above the average. The carbon : nitrogen ratio is normal. The topsoil is moderately saline, the salinity of the subsoil fairly high. The theoretical lime requirement of the topsoil is below the average, that of the subsoil above normal.

Sophia—Field 8 E.—Plant Canes.

The plant cane results from the two trials in Field 8 E., Sophia, are presented in Table IV and Figure II.

TABLE IV.—**Results of 2 Variety Trials in Field 8 East, Sophia.**

PLANTS, 14.75 months.

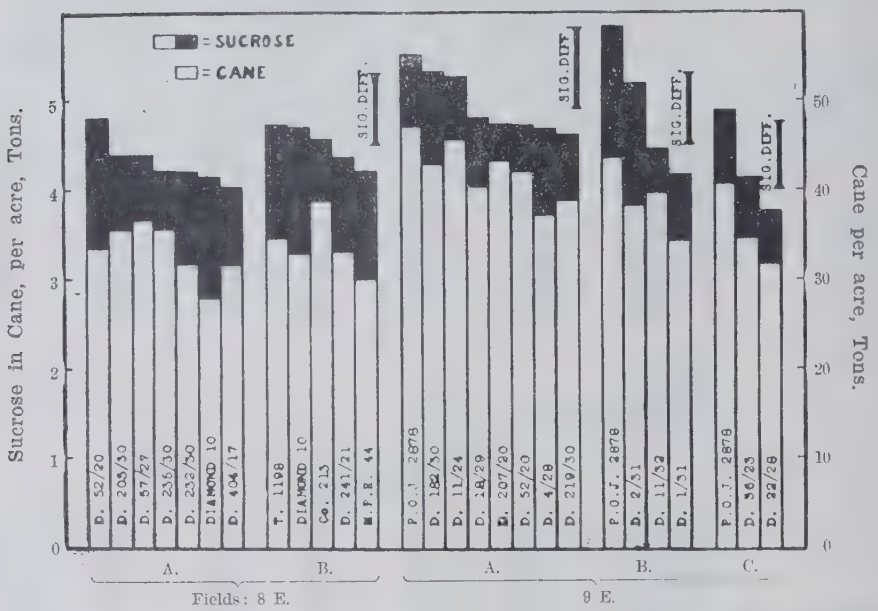
	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.
			Experiment A.				
MEAN YIELDS:	D. 52/20	33.49	14.33	6.51	87.8	4.81	114.80
	D. 205/30	35.49	12.58	4.50	88.5	4.41	105.25
	D. 57/27	36.67	12.06	7.34	82.9	4.41	105.25
	D. 235/30	35.62	11.87	6.96	84.2	4.24	101.19
	D. 232/30	31.84	13.26	5.80	87.4	4.23	100.95
	Diamond 10	27.98	14.81	4.24	88.3	4.16	99.28
	D. 404/17	31.61	12.82	7.22	86.4	4.05	96.66
	D. 444/21	33.24	11.74	8.05	84.5	3.89	92.84
	D. 39/30	28.21	13.76	4.32	89.7	3.88	92.60
	D. 87/27	31.14	12.09	6.85	85.2	3.78	90.21
	Mean:					4.19	100.00
	Standard Error:					—	—
	Significant Difference, 20: 1:					—	—
			Experiment B.				
MEAN YIELDS:	T. 1198	34.46	13.67	3.88	87.5	4.75	119.95
	Diamond 10	32.86	14.28	3.21	88.4	4.72	119.19
	Co. 213	38.79	11.84	4.23	84.0	4.59	115.91
	D. 241/21	32.99	13.35	4.69	87.5	4.38	110.61
	M.P.R. 44	29.91	14.08	3.55	88.3	4.22	106.57
	D. 203/20	41.05	10.13	7.26	80.8	4.18	105.56
	D. 135/30	30.21	12.33	5.20	85.6	3.73	94.19
	M.P.R. 151	27.98	11.22	6.86	83.9	3.18	80.30
	P.R. 826	26.98	11.74	5.14	84.5	3.16	79.80
	P.R. 820	22.35	11.74	7.20	82.7	2.65	66.92
	Mean:					3.96	100.00
	Standard Error:					0.28	7.07
	Significant Difference, 20: 1:					0.81	20.45

In experiment A, five canes led Diamond 10. All have been tested before and were put in this trial because of previous good results. D. 52/20 (parent: D. 625) appears to be definitely superior to D. 625 but is not consistently better than P.O.J. 2878 or Diamond 10. D. 57/27 (parent: D. 666/18), which has now been adequately tested, cannot be recommended. D. 205/30 (parents: B. 6835

x D. 625) has done consistently well in three plant cane experiments ; its ratooning qualtities are now being tested. D. 235/30 (parent : S.C. 12/4) has averaged, as a plant cane, about 8 per cent. better than D. 625, but D. 232/30 (parent : S.C. 12/4), though occasionally superior to D. 625, is not likely to prove a success.

FIG. II.

Sucrose and Cane Yields from Plant Canes at Sophia.



Experiment B, shows that Co. 213 (parents : P.O.J. 213 x Kansar) continues to yield well. Despite its thinness this cane is deserving of careful commercial tests. T. 1198 (parent : M.P. 55) has been tested twice, giving one good and one mediocre result. It will have to be tested further.

Rainfall was satisfactory except at the fifth, seventh, thirteenth and fourteenth months when it was dry. It might, however, be considered as having been excessive from the eighth to the tenth month.

The topsoil of Field 8 E., Sophia, is a markedly acidic heavy silt overlying a slightly acidic heavy silt. The organic matter content is above the average and the carbon : nitrogen ratio of the topsoil is wide. The salinity of the topsoil is low, that of the subsoil fairly high. The theoretical lime requirements of both topsoil and subsoil are below the average.

Sophia—Field 9 E.—Plant Canes.

Table V and Figure II show the results secured from the plant cane reaping of Field 9 E., Sophia.

TABLE V.—**Results of 3 Variety Trials in Field 9 East, Sophia.**

PLANTS, 12.25 months. (Expt. C, 12.00 months).

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.
				Experiment A.			
MEAN YIELDS:	P.O.J. 2878	47.02	11.78	8.02	83.8	5.52	117.20
	D. 182/30	42.85	12.42	7.97	85.1	5.34	113.38
	D. 11/24	45.62	11.44	7.60	84.7	5.28	112.10
	D. 18/29	40.26	11.98	5.41	84.4	4.82	102.34
	D. 207/20	43.24	11.03	9.28	83.6	4.75	100.85
	D. 52/20	42.05	11.29	12.58	82.0	4.74	100.64
	D. 4/28	37.14	12.64	8.44	84.9	4.70	99.79
	D. 219/30	38.82	12.00	9.04	83.3	4.64	98.51
	D. 628/21	39.21	10.57	15.40	79.4	4.14	87.90
	T. 2020	28.63	13.97	4.34	88.1	4.00	84.93
	D. 134/27	40.40	9.60	10.75	80.8	3.88	82.38
	Mean:					4.71	100.00
	Standard Error:					0.32	6.79
	Significant Difference, 20 : 1:					0.92	19.53
				Experiment B.			
MEAN YIELDS:	P.O.J. 2878	43.47	13.35	6.72	86.3	5.84	126.96
	D. 2/31	38.21	13.60	5.12	87.8	5.20	113.04
	D. 11/32	39.58	11.29	8.28	84.0	4.47	97.17
	D. 1/31	34.27	12.20	7.14	84.5	4.18	90.87
	D. 24/30	31.54	10.53	10.81	80.0	3.32	72 17
	Mean:					4.60	100.00
	Standard Error:					0.27	5.87
	Significant Difference, 20 : 1:					0.81	17.61
				Experiment C.			
MEAN YIELDS:	P.O.J. 2878	40.72	12.04	9.12	83.5	4.90	126.61
	D. 36/23	34.51	12.02	12.81	81.1	4.15	107.24
	D. 22/28	31.68	11.95	7.79	84.2	3.78	97.67
	D. 60/30	33.64	10.67	10.11	81.5	3.57	92.25
	D. 83/17	31.61	10.90	13.86	80.4	3.46	89.41
	D. 426/21	34.06	9.77	17.45	77.0	3.37	87.08
	Mean:					3.87	100.00
	Standard Error:					0.26	6.72
	Significant Difference, 20 : 1:					0.77	19.90

The glucose ratios and purities indicate that many of the varieties were immature at the time of harvest. Tonnages were, however, high.

Included in Experiment A were several canes (*e.g.*, D. 11/24, D. 207/20, D. 52/20) which had done well in earlier tests against D. 625. They are obviously not up to the level of the new standard. D. 182/30 (parents : B. 6835 x D. 625), which is second on the list, has given good results elsewhere and will be tested further. D. 628/21 (parent : D. 625) has very frequently outyielded its mother and its low position in this table cannot be considered as typical (*cf.* the results from 50 S. M., Cane Grove, and 11 T.L., Port Mourant).

P.O.J. 2878 outyielded all the canes in Experiment B. D. 1/31 (parents : S.C. 12/4 x D. 625), however, outyielded P.O.J. 2878 by a wide margin in field 50 S.M., Cane Grove, and was a close second to Diamond 10 in field 53 Sv., Leonora. D.2/31 (parents : S.C. 12/4 x D. 625) will be tested further.

None of the canes led by P.O.J. 2878 in Experiment C deserve further study.

It was unusually dry after planting and the canes experienced further dry spells at their third, ninth and tenth months of growth. The fourth, fifth and sixth months were, however, exceptionally wet.

The topsoil of field 9 E., Sophia, is a markedly acidic heavy silt overlying an alkaline clay subsoil. The organic matter content of the topsoil is below the average. The carbon : nitrogen ratio is normal. The salinity of the topsoil is low, that of the subsoil high. The theoretical lime requirements are below normal.

Sophia—Field 10 E.—Plant Canes.

The plant cane results from Field 10 E., Sophia, will be found in Table VI and are illustrated in Figure III.

TABLE VI.—**Results of 2 Variety Trials in Field 10 East, Sophia.**

PLANTS, A, 13.00 months ; B, 12.75 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.
			Experiment A.				
MEAN YIELDS :	P.O.J.2878	43.10	14.94	7.04	85.9	6.42	130.22
	D. 309/21	39.82	13.77	6.73	85.7	5.48	111.16
	P.O.J. 2727	40.37	11.82	12.12	81.0	4.84	98.17
	D. 49/30	33.06	14.37	5.50	87.7	4.70	95.33
	P.R. 807	31.81	13.70	6.18	86.7	4.40	89.25
	D. 404/17	32.09	13.53	7.76	84.8	4.40	89.25
	D. 167/30	33.79	12.52	9.06	83.9	4.29	87.02
	Mean :					4.93	100.00
	Standard Error :					0.40	8.11
	Significant Difference, 20 : 1 :					1.16	23.53
			Experiment B.				
MEAN YIELDS :	P.O.J.2878	39.88	16.11	5.13	88.9	6.44	149.42
	D. 541/22	34.93	14.20	9.52	85.9	4.96	115.08
	D. 165/30	32.97	14.37	6.41	87.9	4.71	109.28
	D. 127/30	37.91	12.32	10.04	84.3	4.68	108.58
	D. 36/23	31.43	13.07	10.22	81.3	4.05	93.97
	D. 51/30	23.34	14.27	7.76	86.3	3.32	77.03
	D. 170/30	25.02	13.06	5.86	84.7	3.25	75.41
	D. 83/17	24.56	12.56	9.75	83.4	3.07	71.23
	Mean :					4.31	100.00
	Standard Error :					0.33	7.66
	Significant Difference, 20 : 1 :					0.96	22.27

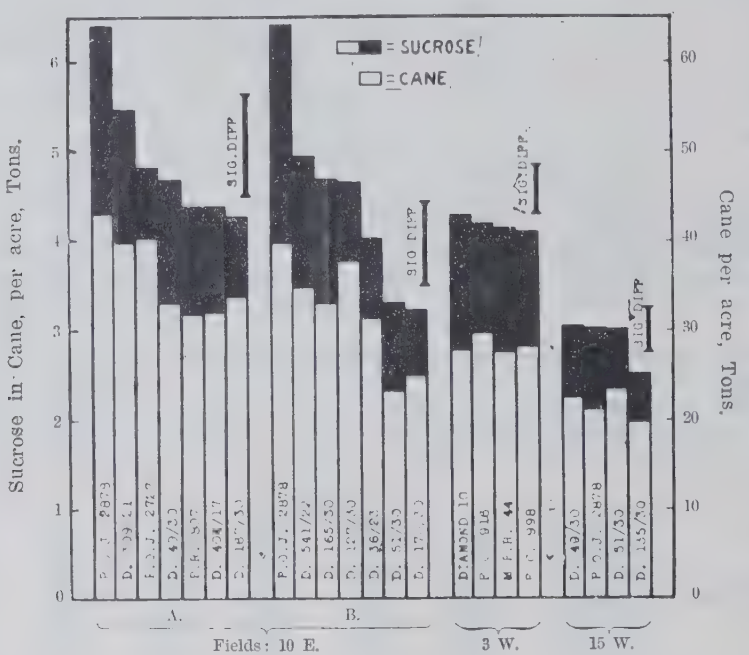
Cane yields were satisfactory and, with one or two exceptions, glucose ratios and purities were fair for canes reaped at this age.

In experiment A, D. 167/30 (parent : D. 145) was unusually disappointing. D. 309/21 (parent : D. 625), which came second, has previously done very well against D. 625 at Port Mourant (*cf.* the results from 11 T.L., Port Mourant, in this Bulletin, and 28 A.E., Port Mourant, on p. 40 of *Sugar Bulletin* No. 5). It does not, however, accommodate itself to pegassy areas (see the results from 97 G.D., Diamond). P.O.J. 2727 (parents : P.O.J. 2364 x S. Batjan) has out-

yielded Diamond 10 on pegassy areas at Diamond. A ready ratooner, it is a comparatively cheap cane to grow. D. 49/30 (parent : D. 625) has several high yields to its credit. Here, however, it was very mediocre and in Field 14 E.W., Providence, it was disappointing.

FIG. III.

Sucrose and Cane Yields from Plant Canes at Sophia.



P.O.J. 2878 led all the canes in Experiment B by a wide margin. It is doubtful, however, if D. 541/22 (parent : D. 145), which was being tested for the first time, was mature.

Rainfall was excessive for the first three months, ample for the fourth and fifth, deficient for the sixth and seventh and slightly subnormal for the eighth and ninth. After that it was excessive for two months and again dry for the two months just prior to harvest.

The topsoil of Field 10 E., Sophia, is a markedly acidic clay overlying an alkaline heavy silt. The organic matter content of the topsoil is low, while the carbon : nitrogen ratio is narrow. The salinity of the topsoil is low, that of the subsoil high. The theoretical lime requirement of the topsoil is below the average, that of the subsoil above normal.

Sophia—Field 3 W.—Plant Canes.

The plant cane data from Field 3 W., Sophia, will be found in Table VII and Figure III.

TABLE VII.—**Results of a Variety Trial in Field 3 West, Sophia.**

PLANTS, 15.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS:	Diamond 10	27.92	15.46	4.11	90.0	4.31	114.63
	F.C. 916	29.83	14.15	4.39	88.9	4.21	111.97
	M.P.R. 44	27.61	15.00	4.04	90.6	4.16	110.64
	F.C. 998	28.27	14.48	4.69	89.1	4.12	109.57
	M.P.R. 49	31.80	12.59	7.40	87.4	4.00	106.38
	P R. 820	27.81	13.53	6.06	87.3	3.77	100.27
	M.P.R. 151	29.72	12.35	5.53	86.9	3.68	97.87
	M.P.R. 145	27.46	12.41	6.22	86.6	3.41	90.69
	T. 2020	24.72	13.59	4.66	88.1	3.36	89.36
	P.R. 803	26.92	12.22	6.06	86.5	3.31	88.03
	P.R. 826	23.67	12 98	5.58	87.2	3.08	81.91
	Mean:					3.76	100.00
	Standard Error:					0.20	5.32
	Significant Difference, 20: 1:					0.58	15.43

Cane tonnages were not high but glucose ratios and purities were good, as might be expected for canes reaped at 15 months. All the varieties tested against Diamond 10 were foreign importations. F.C. 916 (parents: P.O.J. 2725 x S.C. 12/4) has shown promise here and in Field 1 E., Sophia, and will be tested further.

The canes experienced favourable weather for the first four months of growth but the next two were deficient in rainfall. The rainfall of the seventh month was fair but the eighth was again dry. The next five months were very wet and the last two before harvest abnormally dry.

The topsoil of Field 3 W., Sophia, is a highly acidic clay overlying a markedly acidic clay subsoil. The organic matter content is below normal and the carbon : nitrogen ratio is narrow. The salinity of the topsoil is low, that of the subsoil fairly high. The theoretical lime requirement of the top soil is below the average.

Sophia—Field 15 W.—Plant Canes.

Table VIII and Figure III show the plant cane results secured from Field 15 W., Sophia.

TABLE VIII.—**Results of a Variety Trial in Field 15 West, Sophia.**

	PLANTS, 15.50 months.						
	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS:	D. 49/30	22.54	13.61	3.98	89.3	3.06	124.39
	P.O.J. 2878	21.23	14.44	3.76	89.4	3.04	123.58
	D. 51/30	23.53	12.90	5.88	87.2	3.03	123.17
	D. 135/30	19.71	13.00	5.36	87.1	2.54	103.25
	D. 404/17	19.12	12.75	3.38	88.4	2.45	99.59
	D. 57/27	18.86	12.02	4.67	83.8	2.26	91.87
	D. 1/28	17.99	12.48	3.66	87.7	2.25	91.46
	D. 203/20	17.78	11.79	5.24	86.8	2.10	85.37
	D. 9/28	18.22	11.55	4.25	86.8	2.10	85.37
	D. 195/17	14.89	12.19	7.18	85.0	1.81	73.58
	Mean:					2.46	100.00
	Standard Error:					0.18	7.32
	Significant Difference, 20: 1:					0.52	21.14

D. 49/30 (parent: D. 625), which tops the list, has done so on several other occasions as a plant as well as in the two first ratoon trials in which it has as yet appeared.

Except for excessive precipitation when they were four months old, the canes in this trial were well watered until they were seven months of age. The eighth and sixteenth months were much drier than usual and the eleventh to thirteenth abnormally wet.

The topsoil of Field 15 W., Sophia, is a markedly acidic fine silt overlying a slightly acidic fine silt. The organic matter content is below the average, while the carbon: nitrogen ratio of the topsoil is narrow. The salinity of the topsoil is low, that of the subsoil moderate. The theoretical lime requirements are below normal.

Plant Cane Variety Trials Reaped In Berbice.

Two plant cane variety trials were reaped in Berbice during the period. Particulars as to their layout, etc., are given in Table IX.

Table IX.—Plant Cane Variety Trials Reaped in Berbice.

Estate.	Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
			Planting.	Reaping.	Varieties.	Replicates.	
Albion	49 A.	12.50	20.III.36	7.IV.37	10	1	Randomised Blocks
Providence	14 E. W.	15.50	6.VI.35	23.IX.36	5	5	Latin Square.

Albion—Field 49 A.—Plant Canes.

The plant cane results from Field 49 A., Albion, are given in Table X and Figure IV.

Table X.—Results of a Variety Trial in Field 49 A, Albion.

Plants, 12.50 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
Mean Yields:	D. 75/30	44.69	13.68	21.10	84.8	6.11	160.37
	P.O.J. 2878	35.75	15.07	10.62	86.1	5.39	141.47
	D. 66/30	26.20	14.90	6.68	90.4	3.90	102.36
	D. 39/30	22.78	16.37	5.91	90.7	3.73	97.90
	D. 11/28	25.82	13.75	8.62	87.3	3.55	93.18
	D. 18/29	25.35	13.87	7.60	87.5	3.52	92.39
	D. 171/29	25.03	12.93	9.76	86.2	3.24	85.04
	D. 71/30	21.29	15.08	8.21	86.2	3.21	84.25
	D. 51/30	22.73	13.01	15.03	84.4	2.96	77.69
	D. 170/30	18.43	13.39	6.97	86.3	2.47	64.83
	Mean:					3.81	100.00
	Standard Error:					—	—
	Significant Difference, 20 : 1 :					—	—

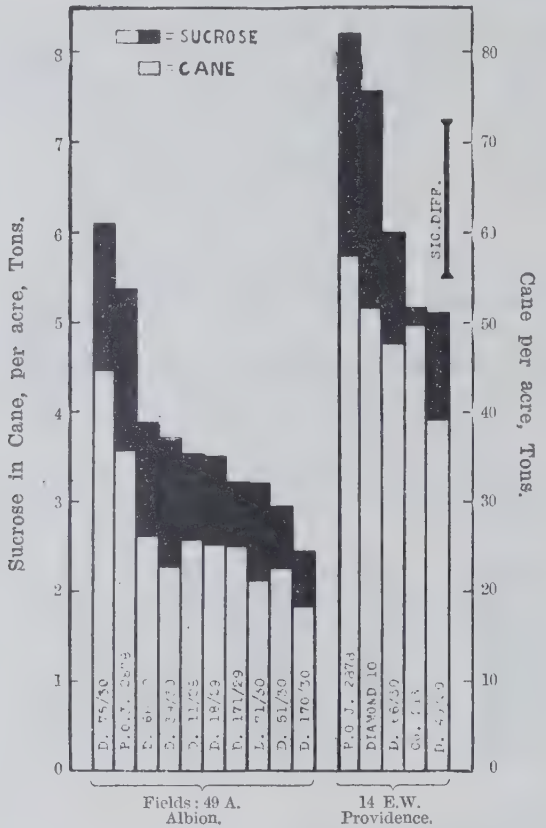
This trial was not replicated, having been put down by the Estate's Manager with nursery material sent from the Central Station. With the possible exception of D. 170/30, however, which has a fair record, the general order of the varieties is similar to that obtained in replicated tests elsewhere.

D. 75/30 (parents : Badila x D. 625) which did so well here, also performed brilliantly in Field 53 Sv., Leonora. Further tests are being made with this variety.

Rainfall was excessive during the first four and the tenth months of the growing period.

FIG. IV.

Sucrose and Cane Yields from Plant Canes at Pln. Albion and Pln. Providence (Berbice).



Providence (Berbice)—Field 14 E.W.—Plant Canes.

Table XI and Figure IV give the plant cane results obtained from Field 14 E.W., Providence.

TABLE XI.—**Results of a Variety Trial in Field 14 E.W., Providence.**

PLANTS, 15.50 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS :	P.O.J. 2878	57.50	14.28	7.91	85.4	8.21	127.88
	Diamond 10	51.61	14.58	7.63	86.2	7.57	117.91
	D. 66/30	47.62	12.67	7.46	85.7	6.02	93.77
	Co. 213	49.83	10.22	9.75	78.8	5.18	80.69
	D. 49/30	39.35	13.01	6.33	86.3	5.12	79.75
	Mean :					6.42	100.00
	Standard Error :					0.57	8.88
	Significant Difference, 20 : 1 :					1.76	27.41

It will be seen that P.O.J. 2878 proved statistically better than all of the varieties except Diamond 10 which it led by a wide margin. Co. 213 had shown great promise but suffered a very severe rat attack which adversely affected cane yields and juice qualities.

This trial experienced, at first, five months of high rainfall, then four of low. The tenth and eleventh months were abnormally wet, the last month before harvest even drier than usual.

The topsoil of Field 14 E.W., Providence, is a highly acidic clay overlying a similar subsoil. The organic matter contents of the topsoil and subsoil are below the average. The carbon : nitrogen ratio is narrow. The salinity of the topsoil is low and that of the subsoil fairly high. The theoretical lime requirement of the topsoil and subsoil is above the average.

Plant Cane Variety Trials Reaped in East Demerara.

Particulars as to the layout, etc., of the plant cane variety trials harvested in East Demerara are given in Table XII.

Table XII.—Plant Cane Variety Trials Reaped in East Demerara.

Estate.	Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
			Planting.	Reaping.	Varieties.	Replicates.	
Cane Grove	50 S.M. A	12.75	19.III.36	9.IV.37	5	5	Latin Square.
„	50 „ B	12.75	19.III.36	9.IV.37	5	5	„
Enmore	13 H. A	12.00	24.IV.36	20.IV.37	5	5	„
„	13 „ B	12.00	24.IV.36	20.IV.37	5	5	„
Lusignan	76 A.	13.50	10.VII.35	28.VIII.36	7	7	„
La Bonne Intention	45 M.W.	14.75	13.VI.35	2.IX.36	7	7	„
Ogle	109 E.	12.50	18.IX.35	1.X.36	7	7	„
Diamond	97 G.D.	15.25	14.VIII.35	23.XI.36	7	7	„

Cane Grove—Field 50 S.M.—Plant Canes.

The data secured from the plant cane reaping of Field 50 S.M., Cane Grove, are presented in Table XIII and Figure V.

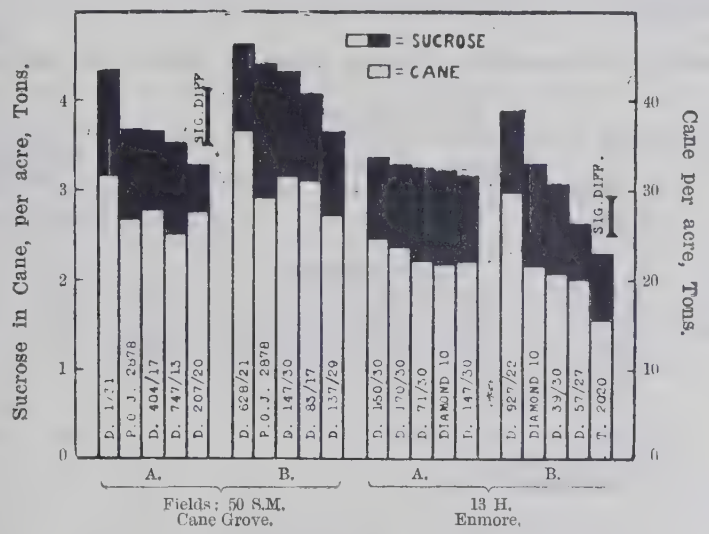
Table XIII.—Results of 2 Variety Trials in Field 50 S.M., Cane Grove.

Plants, 12.75 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
			Experiment A.				
Mean Yields:	D. 1/31	31.59	13.63	8.26	87.7	4.35	117.25
	P.O.J. 2878	26.91	13.71	9.93	87.3	3.69	99.46
	D. 404/17	27.89	13.24	9.85	85.2	3.67	98.92
	D. 747/13	25.21	14.05	12.73	86.2	3.54	95.42
	D. 207/20	27.69	12.00	14.04	81.5	3.30	88.95
	Mean:					3.71	100.00
	Standard Error:					.21	5.66
	Significant Difference, 20 : 1 :					.65	17.52
			Experiment B.				
Mean Yields:	D. 628/21	36.64	12.82	14.15	82.6	4.64	109.95
	P.O.J. 2878	29.31	14.94	7.10	88.4	4.41	104.50
	D. 147/30	31.60	13.64	11.76	85.5	4.33	102.61
	D. 83/17	31.12	13.15	12.23	85.2	4.07	96.45
	D. 137/29	27.30	13.28	12.64	83.0	3.66	86.73
	Mean:					4.22	100.00
	Standard Error:					—	—
	Significant Difference, 20 : 1 :					—	—

FIG. V.

Sucrose and Cane Yields from Plant Canes at Pln. Cane Grove and Pln. Enmore.



In Experiment A, D. 1/31 (parents : S.C. 12/4 x D. 625) proved significantly better than P.O.J. 2878. Its ratooning will be watched with interest for not only did it give 4.6 tons cane per acre more, but its juice was equal in equality to that of the standard cane.

In Experiment B, D. 628/21 (parent : D. 625) heads the list with a higher tonnage but inferior juice to P.O.J. 2878. This cane has yielded promising results not only here but at Lusignan, Wales, Port Mourant and Sophia. It appears to be definitely superior to D. 625, but is a slow ripener. D. 147/30 (parents : D. 625 x S.C. 12/4) will be given some further consideration, but the last two canes in the list will be dropped.

Rainfall during the first four months was ample, tending to be excessive in the first two. The next five months were drier than might have been expected and the following two unusually wet. Drought conditions prevailed during the two months prior to harvest.

The topsoil of Field 50 S.M., Cane Grove, is a highly acidic pegassy clay overlying a similar subsoil. The organic matter content of both topsoil and subsoil are above the average while the carbon : nitrogen ratio is normal. Both topsoil and subsoil are of low salinity. The theoretical lime requirement of the topsoil is of an average value, that of the subsoil above normal.

Enmore—Field 13 H.—Plant Canes.

In Table XIV and Figure V will be found the plant cane results from Field 13 H., Enmore.

TABLE XIV.—Results of 2 Variety Trials in Field 13 H., Enmore.

PLANTS, 12.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.
			Experiment A.				
MEAN YIELDS:	D. 150/30	24.72	13.71	8.55	85.4	3.38	103.36
	D. 170/30	23.73	14.07	6.02	87.2	3.30	100.92
	D. 71/30	22.17	14.70	8.02	87.7	3.26	99.69
	Diamond 10	21.88	14.87	6.14	88.4	3.23	98.78
	D. 147/30	22.17	14.36	7.45	88.2	3.17	96.94
	Mean:					3.27	100.00
	Standard Error:					—	—
	Significant Difference, 20 : 1 :					—	—
			Experiment B.				
MEAN YIELDS:	D. 927/22	29.91	13.14	7.00	86.8	3.90	127.87
	Diamond 10	21.62	15.28	7.38	89.2	3.31	108.52
	D. 39/30	20.80	14.83	5.06	90.0	3.08	100.98
	D. 57/27	20.10	13.22	9.14	84.4	2.65	86.89
	T. 2020	15.61	14.78	4.55	88.8	2.31	75.74
	Mean:					3.05	100.00
	Standard Error:					0.15	4.92
	Significant Difference, 20 : 1 :					0.46	15.08

Despite comparatively early reaping, purities were reasonably high and glucose ratios low. This and the low cane yields must be attributed to the very unfavourable weather conditions.

In Experiment A, there was little to choose between the yields of the various seedlings and all must be tested as ratoons.

In Experiment B, D. 927/22 (parent: D. 4399) proved significantly better than Diamond 10. This cane also did very well, both as a plant and first ratoon in Field 15 B.A., Enmore. The last three canes on the list will not be considered further.

Rainfall on this trial was, in general, low, the deficiency totalling 18.27 in. This was reflected in low cane yields and high purities.

The topsoil of Field 13 H., Enmore, is a markedly acidic clay overlying a similar subsoil. The organic matter content of the topsoil is high, that of the subsoil normal. The carbon : nitrogen ratio of the topsoil is normal, that of the subsoil wide. The salinity of the topsoil is moderate, that of the subsoil fairly high. The theoretical lime requirements of the topsoil and subsoil are above the average.

Lusignan—Field 76 A.—Plant Canes.

The plant cane results from Field 76 A., Lusignan, are given in Table XV and Figure VI.

TABLE XV.—Results of a Variety Trial in Field 76 A., Lusignan.

PLANTS, 13.50 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre.	
						Tons.	% Mean.
MEAN YIELDS:	Co. 213	59.84	13.14	6.59	85.0	7.86	123.58
	Diamond 10	47.72	14.57	6.39	87.6	6.93	108.96
	D. 170/30	51.29	13.19	6.51	86.8	6.77	106.45
	D. 173/30	46.14	13.58	7.03	86.5	6.26	98.43
	D. 49/30	44.88	13.67	5.48	89.5	6.12	96.23
	D. 66/30	44.19	13.19	5.55	88.5	5.83	91.67
	D. 171/29	40.63	11.65	9.15	82.9	4.72	74.21
	Mean :					6.36	100.00
	Standard Error :					0.24	3.77
	Significant Difference, 20 : 1 :					0.69	10.85

With a favourable growing season, tonnages were high, nevertheless purities and glucose ratios were satisfactory. Co. 213 (parents : P.O.J. 213 x Kansar) again distinguished itself, its increment over Diamond 10 being statistically significant. D. 49/30 and D. 66/30 were disappointing but their behaviour elsewhere ensures their being tested further. D. 171/29 (parent : P.O.J. 2725) will be discarded.

This field had, on the whole, a very favourable growing season and no serious deficiency was noted in the rainfall save at the eighth and fourteenth months of growth. The major excesses occurred when the canes were old enough to withstand them.

The topsoil of Field 76 A., Lusignan, is a highly acidic clay overlying a markedly acidic clay subsoil. The organic matter content is below normal. The salinity of the topsoil is low, that of the subsoil is moderate. The carbon : nitrogen ratio of the topsoil is normal, that of the subsoil wide. The theoretical lime requirement of the topsoil is below the normal, that of the subsoil above.

La Bonne Intention—Field 45 M.W.—Plant Canes.

Table XVI and Figure VI contain the plant cane results from Field 45 M.W., La Bonne Intention.

TABLE XVI.–Results of a Variety Trial in Field 45 M.W., La Bonne Intention.

PLANTS, 14.75 months.

	Variety.	Cane per Acre. Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS:	D. 170/30	51.81	12.70	7.60	85.1	6.57	117.32
	D. 113/30	44.57	13.49	6.06	87.2	6.01	107.32
	D. 49/30	39.98	14.19	4.53	88.5	5.67	101.25
	D. 241/21	43.94	12.81	7.54	85.3	5.64	100.71
	D. 625	42.53	12.74	12.41	83.4	5.42	96.79
	D. 66/30	40.31	12.56	6.37	86.0	5.04	90.00
	D. 171/29	39.50	12.26	6.18	84.5	4.85	86.61
	Mean:					5.60	100.00
	Standard Error:					0.18	3.21
	Significant Difference, 20 : 1:					0.52	9.29

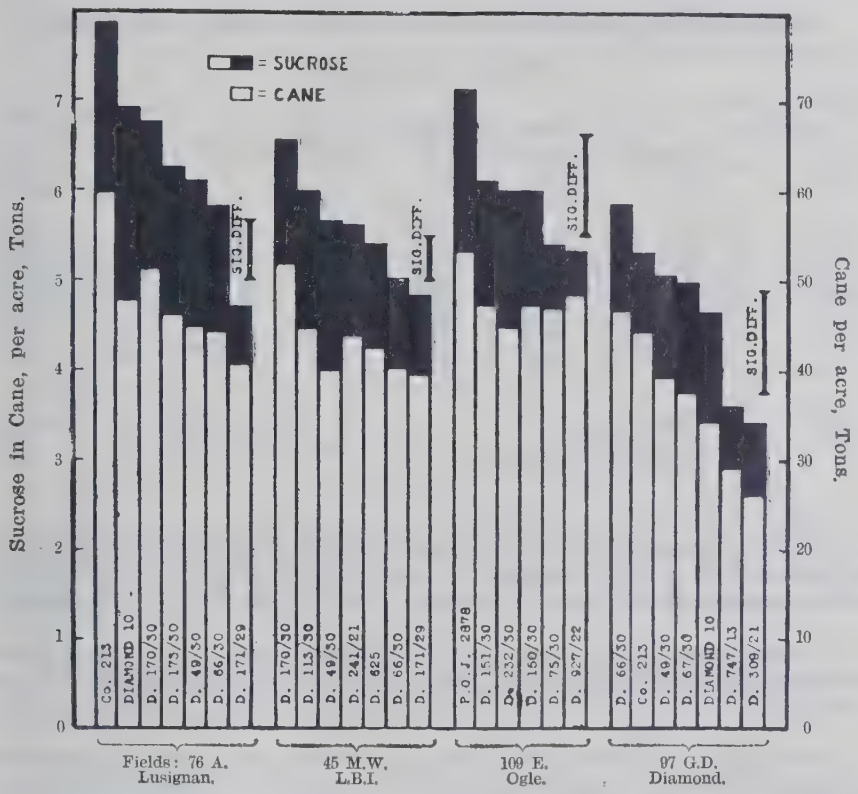
D. 170/30 (parent: D. 145) led all varieties by a statistically significant margin. D. 113/30 (parents: D. 238/17 x S.C. 12/4) also proved significantly better than the standard, D. 625. D. 66/30 was lower than usual, but the good juice qualities of D. 49/30 ensured it a fair position. At the fairly advanced age of 14.75 months, D. 625 showed a low purity and high glucose ratio.

Rains were probably a little heavy for the young crop at the start, but lightened up later until at the seventh month it was somewhat dry. Then the mid-year rains of 1936 came in and the field was eventually reaped after a dry August 1936.

The topsoil of Field 45 M.W., La Bonne Intention, is a markedly acidic clay overlying an alkaline clay subsoil. The topsoil and subsoil contain subnormal amounts of organic matter with a carbon : nitrogen ratio wider than the average. The lime requirements of both topsoil and subsoil are normal.

FIG. VI.

Sucrose and Cane Yields from Plant Canes at Pln. Lusignan, Pln. La Bonne Intention, Pln. Ogle and Pln. Diamond.



Ogle—Field 109 E.—Plant Canes.

The plant cane data secured from Field 109 E., Ogle, are presented in Table XVII and Figure VI.

TABLE XVII.—**Results of a Variety Trial in Field 109 E., Ogle.**

	PLANTS, 12.50 months.						
	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS:	P.O.J. 2878	53.31	13.46	10.64	84.6	7.15	123.06
	D. 151/30	47.37	12.75	11.00	85.2	6.13	105.51
	D. 232/30	44.95	13.37	10.27	83.6	6.02	103.61
	D. 150/30	47.35	12.71	14.20	83.2	6.02	103.61
	D. 75/30	47.01	11.53	18.68	80.5	5.41	93.12
	D. 927/22	48.53	11.03	15.42	80.6	5.35	92.08
	M.P.R. 151	37.88	12.01	12.94	84.8	4.56	78.49
	Mean:					5.81	100.00
	Standard Error:					0.40	6.88
	Significant Difference, 20 : 1					1.16	19.97

Yields were, in general, high and purities low, but P.O.J. 2878 led all competitors here by a wide margin. D. 75/30 (parents: Badila x D. 625) and D. 927/22 (parent: D. 4399) were unusually low. M.P.R. 151 will be discarded.

It was unusually dry at the sixth, twelfth and thirteenth months of growth, but during the rest of the growing season the monthly rainfall only fell once below 4 in.

The topsoil of Field 109 E., Ogle, is a markedly acidic fine silt overlying a markedly acidic clay. The organic matter content of both topsoil and subsoil is normal, while the carbon : nitrogen ratio is of the average value. The salinity of the topsoil is low, that of the subsoil moderate. The theoretical lime requirements of both topsoil and subsoil are normal.

Diamond—97 G.D.—Plant Canes.

In Table XVIII and Figure VI are presented the plant cane results from Field 97 G.D., Diamond.

TABLE XVIII.—**Results of a Variety Trial in Field 97 G.D., Diamond.**

PLANTS, 15.25 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity	Sucrose in Cane per Acre.	
						Tons.	% Mean.
MEAN YIELDS:	D. 66/30	46.72	12.63	7.77	88.3	5.88	124.58
	Co. 213	44.43	12.01	10.34	84.8	5.34	113.14
	D. 49/30	39.42	13.04	7.82	87.6	5.08	107.63
	D. 67/30	37.58	13.31	8.49	88.3	5.00	105.94
	Diamond 10	34.29	13.52	8.30	88.0	4.66	98.73
	D. 747/13	29.10	12.62	10.44	85.4	3.62	76.69
	D. 309/21	26.10	13.15	6.92	87.6	3.43	72.67
	Mean:					4.72	100.00
	Standard Error:					0.40	8.47
	Significant Difference, 20 : 1:					1.16	24.58

D. 66/30 (parents: Diamond 10 x S.C. 12/4) was definitely superior to Diamond 10, and Co. 213 also led the standard cane by a wide margin. D. 49/30 (parent: D. 625) and D. 67/30 (parents: Diamond 10 x S.C. 12/4) also gave encouraging returns. The last two varieties on the list were very disappointing.

Despite a total deficit of 19 in. from the normal rainfall, yields were satisfactory. There were only three months when the rainfall was under 3 in. and on two of these occasions it was 2.95 in.

The topsoil of Field 97 G.D., Diamond, is a highly acidic pegassy clay overlying a highly acidic clay subsoil. The organic matter content is below the average with a narrow carbon : nitrogen ratio in the topsoil and a wide ratio in the subsoil. The topsoil and the subsoil are of low salinity. The theoretical lime requirement is below normal in the topsoil while that in the subsoil is above.

Plant Cane Variety Trials Reaped in West Demerara.

Table XIX gives particulars as to the layout, etc., of the plant cane variety trials reaped in West Demerara during the period.

TABLE XIX.—**Plant Cane Variety Trials Reaped in West Demerara.**

Estate.	Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
			Planting.	Reaping.	Varieties.	Replicates.	
Wales	39V. A	12.25	1.IV.36	8.IV.37	5	5	Latin Square.
,,	39V. B	12.25	1.IV.36	8.IV.37	3	5	Randomised Blocks.
Uitvlugt	46deW.	17.00	19.IX.35	16.II.37	7	7	Latin Square.
,,	13E.	12.50	3.IV.36	14.IV.37	5	5	,,
Leonora	16G.V.	12.25	25.IX.35	30.IX.36	7	7	,,
,,	53Sv. A	13.00	17.III.36	15.IV.37	4	5	Randomised Blocks.
,,	53Sv. B	13.00	17.III.36	15.IV.37	5	5	Latin Square.

Wales—Field 39 V.—Plant Canes.

The data from the two plant cane trials reaped in Field 39 V., Wales, are presented in Table XX and Figure VII.

TABLE XX.—**Results of 2 Variety Trials in Field 39 V., Wales.**

PLANTS, 12.25 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
			Experiment A.				
MEAN YIELDS:	D. 927/22	24.44	12.79	13.36	84.2	3.11	129.58
	D. 66/30	17.47	15.41	4.86	91.2	2.67	111.25
	D. 628/21	20.43	12.97	16.43	83.0	2.65	110.42
	D. 39/30	12.19	15.18	6.21	91.2	1.84	76.67
	P.O.J. 2878	11.73	14.80	9.37	87.2	1.73	72.08
	Mean:					2.40	100.00
	Standard Error:					0.20	8.33
	Significant Difference, 20 : 1 :					0.62	25.83
			Experiment B.				
MEAN YIELDS:	Co. 213	27.99	12.98	9.83	85.8	3.62	109.37
	P.O.J. 2878	22.32	14.71	9.53	87.8	3.24	97.89
	M.P.R. 42	22.13	13.88	5.87	88.0	3.06	92.45
	Mean:					3.31	100.00
	Standard Error:					—	—
	Significant Difference, 20 : 1 :					—	—

Growth was in general poor and the area appears to be not too fertile, albeit weather conditions were unfavourable.

In Experiment A, the standard cane, P.O.J. 2878, was almost a complete failure, although in Experiment B, alongside, it yielded twice as much. This is a striking example of the danger that lurks in judging a cane by its performance in a single plot and emphasises the value of replication if one is to avoid too hasty condemnation or recommendation.

D. 927/22 (parent : D. 4399), D. 66/30 (parents: Diamond 10 x S.C. 12/4), D. 628/21 (parent : D. 625) and Co. 213 (parents : P.O.J. 213 x Kansar) have all done well in other trials and are being given commercial consideration in various areas.

Four months heavy rains at the start and two droughts later, separated by two months of unusually heavy rainfall, all contributed to the poor yields recorded.

The topsoil of Field 39 V., Wales, is a highly acidic clay overlying a highly acidic pegassy clay. The organic matter content is below the average and its carbon : nitrogen ratio narrow. The salinity of both topsoil and subsoil is low. The theoretical lime requirement of the topsoil is normal, that of the subsoil low.

Leonora—Field 16 Gv.—Plant Canes.

The plant cane results from Field 16 Gv., Leonora, are presented in Table XXI and Figure VII.

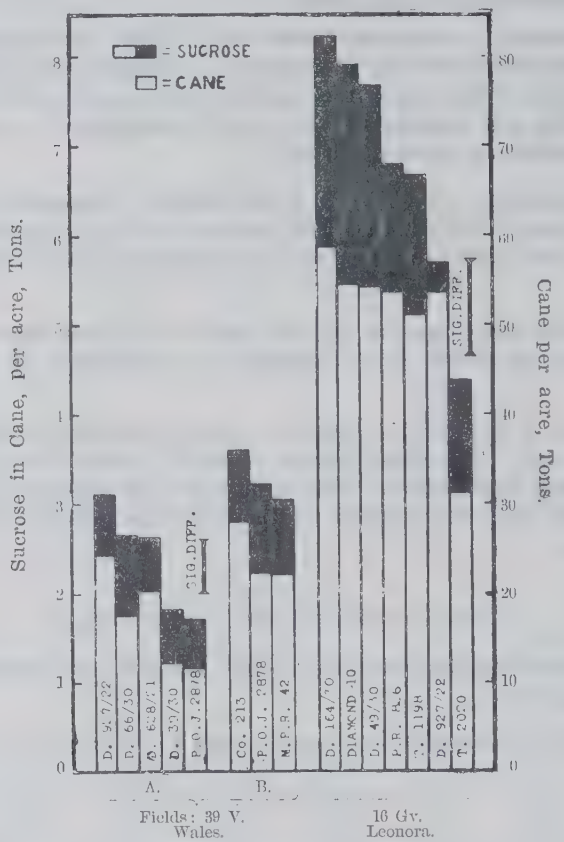
TABLE XXI.—Results of a Variety Trial in Field 16 Gv., Leonora.

PLANTS, 12.25 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS :	D. 164/30	58.76	14.00	8.17	87.3	8.25	121.68
	Diamond 10	54.50	14.59	9.35	86.6	7.93	116.96
	D. 49/30	54.35	14.14	7.94	88.4	7.70	113.57
	P.R. 826	53.69	12.71	10.28	85.1	6.81	100.44
	T. 1198	51.14	13.11	11.81	84.2	6.69	98.67
	D. 927/22	53.60	10.68	20.03	77.2	5.71	84.22
	T. 2020	31.32	14.08	5.68	88.7	4.40	64.90
	Mean :					6.78	100.00
	Standard Error :					0.38	5.60
	Significant Difference, 20 : 1 :					1.10	16.22

FIG. VII.

Sucrose and Cane Yields from Plant Canes at Pln. Wales and Pln. Leonora.



Taking into consideration the high yields and rather early reaping, the purities and glucose ratios, with a single exception, were fair.

D. 164/30 (parent : D. 145) was satisfactory in all respects and D. 49/30 (parent : D. 625) followed the standard cane closely. D. 927/22 (parent : D. 4399) was put out of the running by its poor juice. T. 2020 (parent : B. 6835), which had looked extremely promising in the early months of growth, was a failure.

Rainfall conditions were, on the whole, favourable to this trial. Although the rainfall was somewhat below normal, it is doubtful if the deficiency was important in its effect save for two months during growth. On the other hand five months of heavy rainfall about the middle of the growth period might have been excessive.

The topsoil of Field 16 Gv., Leonora, is a markedly acidic heavy silt overlying a similar subsoil. The organic matter content of the topsoil is below the average, that of the sub-soil above. The carbon : nitrogen ratio is below the average. The topsoil is of low salinity while the subsoil is moderately saline. The theoretical lime requirement of the topsoil is of an average value, that of the subsoil below normal.

Leonora—Field 53 Sv.—Plant Canes.

In Table XXII and Figure VIII will be found the plant cane results from Field 53 Sv., Leonora.

TABLE XXII.—**Results of 2 Variety Trials in Field 53 Sv., Leonora.**

PLANTS, 13.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.
			Experiment A.				
MEAN YIELDS :	D. 75/30	32.62	15.11	9.14	87.2	4.91	130.58
	Diamond 10	22.49	16.67	6.30	90.0	3.75	99.73
	D. 1/31	23.48	15.09	7.42	88.7	3.54	94.15
	D. 51/30	19.24	14.82	11.70	86.1	2.85	75.80
	Mean :					3.76	100.00
	Standard Error :					0.17	4.52
	Significant Difference, 20 : 1 :					0.52	13.83
			Experiment B.				
	P.O.J. 2878	26.95	16.07	8.36	88.3	4.35	117.89
	Diamond 10	24.42	16.67	6.69	89.3	4.07	110.30
MEAN YIELDS :	D. 628/21	23.02	14.90	9.57	85.8	3.43	92.95
	D. 66/30	21.51	15.62	5.60	90.4	3.36	91.06
	D. 11/28	21.38	15.14	8.73	87.4	3.23	87.53
	Mean :					3.69	100.00
	Standard Error :					0.23	6.23
	Significant Difference, 20 : 1 :					0.71	19.24

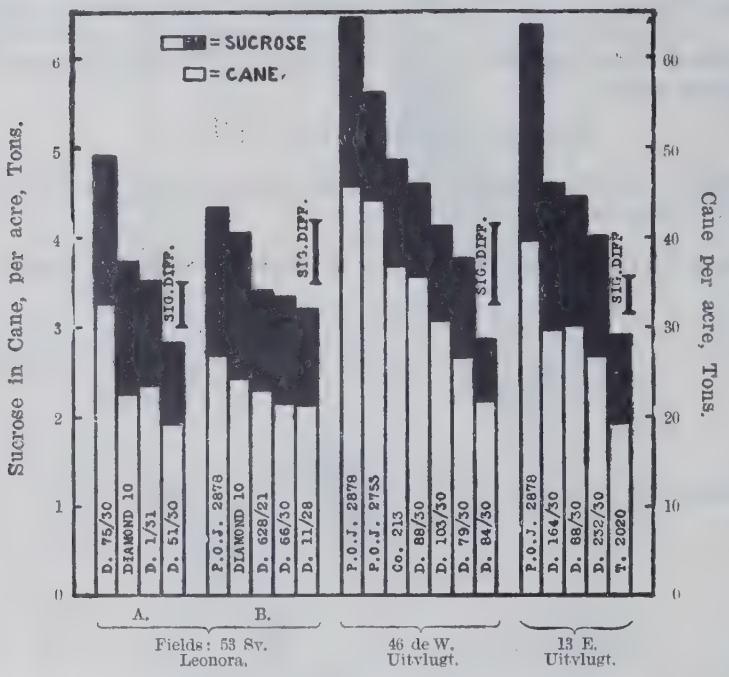
Reaped at 13 months, these canes yielded very satisfactory purities.

In Experiment A, D. 75/30 (parents : Badila x D. 625) led all competitors by a wide and statistically significant margin. D. 1/31 (parents : S.C. 12/4 x D. 625) followed close behind Diamond 10 which showed the best juice qualities.

In Experiment B, P.O.J. 2878 was ahead of Diamond 10 with a heavier cane tonnage and a slightly inferior juice. The last three canes on the list have done much better in other trials but were disappointing here.

FIG. VIII.

Sucrose and Cane Yields from Plant Canes at Pln. Leonora and Pln. Uitvlugt.



This trial had four very wet months at its start and two droughts, separated by a couple of months of exceptionally high precipitation later. These unusual weather conditions were reflected in mediocre cane yields.

The topsoil of Field 53 Sv., Leonora, is a highly acidic heavy silt overlying a highly acidic clay subsoil. The organic matter content of the topsoil is above the normal, that of the subsoil of an average value. The carbon : nitrogen ratio of the topsoil is of an average value, that of the subsoil narrow. The salinity of both topsoil and subsoil is low. The theoretical lime requirements are above the average.

Uitvlugt—Field 46 deW.—Plant Canes.

The results of the plant cane reaping of Field 46 deW., Uitvlugt, are given in Table XXIII and Figure VIII.

TABLE XXIII.— **Results of a Variety Trial in Field 46 de W., Uitvlugt.**

PLANTS, 17.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre.	
						Tons.	% Mean.
MEAN YIELDS :	P.O.J. 2878	45.67	14.18	5.88	89.3	6.46	139.52
	P.O.J. 2753	44.11	12.75	5.83	88.4	5.63	121.60
	Co. 213	36.79	13.07	6.70	86.6	4.89	105.62
	D. 88/30	35.57	12.94	11.04	85.1	4.61	99.57
	D. 103/30	30.72	13.58	7.34	88.8	4.15	89.63
	D. 79/30	26.60	14.30	7.16	87.8	3.79	81.86
	D. 84/30	21.84	13.67	7.83	88.1	2.88	62.20
	Mean :					4.63	100.00
	Standard Error :					0.32	6.91
	Significant Difference, 20 : 1					0.92	19.87

The reaping of this field was unavoidably postponed until the canes had reached the unusual age of 17 months. The yield was good for this type of soil, with P.O.J. 2878 significantly better than five of the varieties tried. Nevertheless, the record of P.O.J. 2753 and Co. 213 elsewhere makes these deserving of further consideration on this soil type.

At planting the rainfall was normal, but it was less than usual during the next four months. There followed two unusually wet months and the usual mid-year rainy season. Next came the drought of the Autumn of 1936, a wetter December and January than usual, and a dry February just before harvest.

The topsoil of Field 46 deW., Uitvlugt, is a highly acidic pegassy clay overlying a similar subsoil. The organic matter content is below normal, and the carbon : nitrogen ratio is narrow. The salinity of both topsoil and subsoil is low. The theoretical lime requirement of the topsoil is above the average, that of the subsoil normal.

Uitvlugt—Field 13 E.—Plant Canes.

Table XXIV and Figure VIII present the results obtained from the plant canes in Field 13 E., Uitvlugt.

TABLE XXIV.— **Results of a Variety Trial in Field 13 E., Uitvlugt.**

PLANTS, 12.50 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS:	P.O.J. 2878	39.62	16.09	8.65	88.2	6.37	142.19
	D. 164/30	29.72	15.51	6.52	87.8	4.61	102.90
	D. 88/30	30.11	14.66	8.98	86.4	4.46	99.55
	D. 232/30	26.80	15.00	8.23	87.5	4.02	89.73
	T. 2020	19.42	15.04	7.18	87.7	2.93	65.40
	Mean:					4.48	100.00
	Standard Error:					0.14	3.12
	Significant Difference, 20 : 1 :					0.43	9.60

It will be seen that P.O.J. 2878 was by far the best of the canes tested D. 164/30 (parent : D. 145) which came a poor second, led Diamond 10 in Field 16 Gv., Leonora. T. 2020 was a failure.

This trial had too much rain at its start, then a drought followed by two wet months and a further period of dry weather.

The topsoil of Field 13 E., Uitvlugt, is a highly acidic heavy silt overlying a markedly acidic clay subsoil. The organic matter content of both topsoil and subsoil are above the average. The carbon : nitrogen ratio of the topsoil is normal, that of the subsoil wide. The salinity of the topsoil and subsoil is low. The theoretical lime requirements are of an average value.

SUB-SECTION B.—FIRST RATOON VARIETY TRIALS.

FIRST RATOON VARIETY TRIALS REAPED AT SOPHIA SUGAR EXPERIMENT STATION.

Details of the reaping dates, layout, etc., of the first ratoon variety trials reaped at the Sophia Sugar Experiment Station are recorded in Table XXV.

TABLE XXV.

First Ratoon Variety Trials Reaped at Sophia Experiment Station.

Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
		Previous Reaping.	Reaping.	Varieties.	Replicates.	
3 East A	12.00	13.IX.35	15.IX.36	10	5	Randomised Blocks.
3 „ B	12.00	13.IX.35	15.IX.36	5	5	„
5 West	12.00	27.XI.35	23.XI.36	4	5	„
7 „	11.75	22.XI.35	18.XI.36	7	5	„
8 „	11.75	28.XI.35	19.XI.36	7	5	„
9 „	11.75	3.XII.35	25.XI.36	6	9	„

Sophia—Field 3 E.—First Ratoons.

The results from the two trials in Field 3 E., Sophia, are presented in Table XXVI and Figure IX.

TABLE XXVI.—Results of 2 Variety Trials in Field 3 East, Sophia.

1ST RATOONS, 12.00 months.

	Variety	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.	Combined Results for 2 Crops, Plants and 1st Ratoons. Variety.	Combined Results for 2 Crops, Plants and 1st Ratoons. Sucrose in Cane per Acre, Tons.
				Experiment A.					
	D. 64/30	29.57	14.19	8.14	85.4	4.19	122.16	D. 219/30	9.29
	D. 52/20	28.21	13.62	8.93	84.7	3.84	111.95	D. 52/20	8.96
	D. 219/30	30.27	12.55	9.83	84.7	3.79	110.50	D. 64/30	8.90
MEAN	D. 625	29.61	12.50	11.70	81.0	3.70	107.87	D. 625	7.91
YIELDS:	B. 755	27.79	12.86	9.11	85.4	3.58	104.37	D. 134/27	7.77
	B. 726	24.70	13.96	7.63	88.5	3.47	101.17	B. 726	7.48
	D. 134/27	30.28	10.86	10.38	82.0	3.25	94.75	B. 755	7.42
	D. 30/28	27.58	10.96	8.89	83.2	2.99	87.17	D. 62/30	7.29
	D. 62/30	21.06	14.01	9.35	84.7	2.96	86.30	D. 30/28	6.98
	B. 417	19.83	12.82	7.83	86.4	2.55	74.34	B. 417	6.73
	Mean:					3.43	100.00		
	Standard Error:					0.25	7.29		
	Significant Difference, 20: 1:					0.72	20.99		
				Experiment B.					
	D. 178/29	33.11	15.01	6.76	89.2	4.95	137.50	D. 178/29	9.96
MEAN	D. 625	31.04	12.95	12.71	84.3	4.02	111.67	D. 69/29	9.44
YIELDS:	D. 69/29	26.00	13.32	9.30	86.5	3.51	97.50	D. 625	9.14
	D. 140/29	22.84	12.32	12.35	83.0	2.82	78.33	D. 140/29	7.83
	D. 18/29	23.69	11.51	9.87	83.7	2.72	75.56	D. 18/29	7.76
	Mean:					3.60	100.00		
	Standard Error:					0.25	6.94		
	Significant Difference, 20: 1:					0.75	20.83		

(*Plant cane results reported in Sugar Bull. No. 5, p. 3.*)

In Experiment A, three varieties led D. 625. D. 219/30 (parents : D. 625 x S.C. 12/4) owes its position mainly to high plant cane yield. It does not, however, appear to be a consistently high yielder. D. 52/20 (parent ; D. 625) can

generally be depended on to outyield D. 625, than which it has a better juice. D. 64/30 (parents : Diamond 10 x S.C. 12/4) is also slightly better than D. 625 but cannot compete against P.O.J. 2878.

Of the canes in Experiment B, D. 178/29 (parents : D. 625 x B.H. 10/12) and D. 69/29 (parents : S.C. 12/4 x D. 625) seem worthy of further consideration.

The rainfall on this trial was irregular. It was sufficient for the first two months and somewhat dry for the next four. From the seventh to ninth months it was excessive ; about normal but high at the eleventh and twelfth, and markedly deficient at the thirteenth.

The markedly acidic heavy silt of Field 3 E., Sophia, was discussed on p. 5 of *Sugar Bulletin* No. 5.

Sophia—Field 5 W.—First Ratoons

Table XXVII and Figure IX give the results secured from Field 5 W., Sophia.

TABLE XXVII.— **Results of a Variety Trial in Field 5 West, Sophia.**

1ST RATOONS, 12.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS :	P.O.J. 2878	35.82	13.68	8.29	87.6	4.95	109.03	P.O.J. 2878	11.35
	Diamond 10	37.24	13.06	9.38	87.4	4.89	107.71	Diamond 10	11.09
	D. 625	38.68	11.18	18.70	80.6	4.32	95.15	D. 625	10.79
	G. 119	31.32	12.75	8.44	87.1	3.99	87.89	G. 119	8.92
	Mean :					4.54	100.00		
	Standard Error :					...	...		
	Significant Difference, 20 : 1 :					...	...		

(*Plant cane results reported in Sugar Bull. No. 5, p. 9.*)

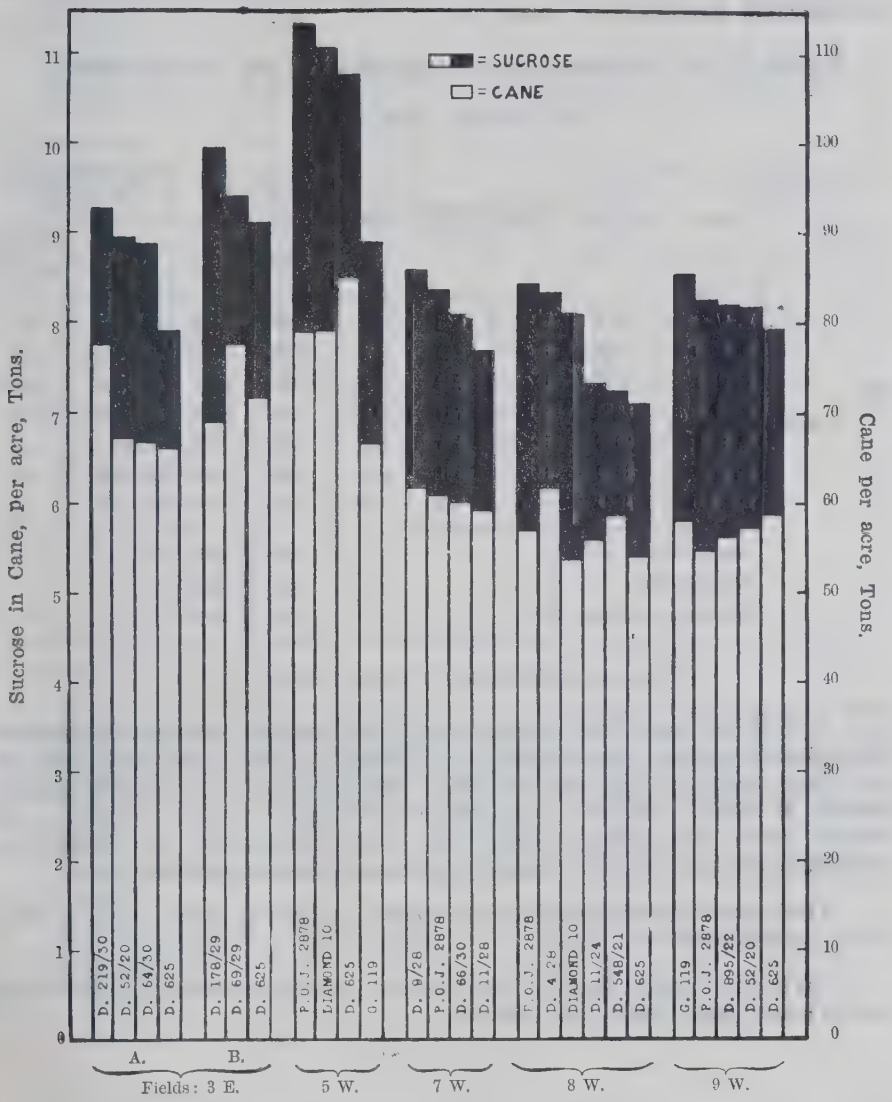
P.O.J. 2878 and Diamond 10 head the list, with the former slightly above the latter. Juices were good, except in the case of D. 625 which was very unsatisfactory.

It was unusually dry just after the previous harvest and these canes experienced further dry spells at their third, ninth and tenth months of growth. The fourth, fifth and sixth months were, however, exceptionally wet.

The slightly acidic clay soil of Field 5 W., Sophia, has been described on p. 10 of *Sugar Bulletin* No. 5.

FIG. IX.

Sucrose and Cane Yields from Plant Canes and First Ratoons at Sophia.



Sophia—Field 7 W.—First Ratoons.

The results secured from Field 7 W., Sophia, are given in Table XXVIII and presented graphically in Figure IX.

TABLE XXVIII.—**Results of a Variety Trial in Field 7 West, Sophia.**

1ST RATOONS, 11.75 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	D. 9/28	30.78	13.96	6.43	88.6	4.28	131.29	D. 9/28	8.61
	D. 66/30	27.98	13.65	4.89	89.7	3.73	114.42	P.O.J. 2878	8.40
	D. 11/28	25.63	13.47	7.49	88.9	3.44	105.52	D. 66/30	8.12
	P.O.J. 2878	26.36	13.01	7.17	87.4	3.41	104.60	D. 11/28	7.71
	T. 1198	20.27	14.35	4.41	89.5	2.92	89.57	T. 1198	7.49
	D. 19/30	18.29	14.61	4.61	90.4	2.70	82.82	D. 19/30	6.73
	P.R. 820	18.49	12.71	7.28	86.4	2.34	71.78	P.R. 820	5.52
	Mean:					3.26	100.00		
	Standard Error:					0.33	10.12		
	Significant Difference, 20: 1:					0.96	29.45		

(*Plant cane results reported in Sugar Bull. No. 5, p. 11.*)

It will be seen that glucose ratios and purities were very satisfactory. Several canes ratooned better than P.O.J. 2878 in this field, but in total yield for two crops only D. 9/28 (parents: S.C. 12/4 x D. 625) outyielded the standard though D. 66/30 (parents: Diamond 10 x S.C. 12/4) followed it closely. The second ratoon results should clarify the position somewhat. No further consideration will, however, be given to the last two canes on the list.

These canes experienced the same weather conditions as did those of Field 5 W., described above.

On p. 12 of *Sugar Bulletin* No. 5 will be found a description of the slightly acidic heavy silt of Field 7 W., Sophia.

Sophia—Field 8 W.—First Ratoons.

The data secured from the test in Field 8 W., Sophia are presented in Table XXIX and Figure IX.

TABLE XXIX.—**Results of a Variety Trial in Field 8 West, Sophia.**

1ST RATOONS, 11.75 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
	P.O.J. 2878	27.62	14.51	7.07	89.0	3.99	118.75	P.O.J. 2878	8.46
	Diamond 10	23.89	15.25	7.81	90.7	3.61	107.44	4/28	8.36
MEAN	D. 4/28	27.67	13.01	12.99	86.0	3.59	106.85	Diamond 10	8.14
YIELDS:	D. 625	26.59	12.84	13.35	85.8	3.42	101.79	11/24	7.36
	D. 11/24	25.52	12.73	8.86	88.6	3.25	96.73	548/21	7.27
	D. 548/21	27.25	11.99	12.74	85.8	3.24	96.43	D. 625	7.14
	D. 895/22	18.13	13.31	8.14	88.7	2.39	71.13	895/22	6.59
	Mean:					3.36	100.00		
	Standard Error:					—	—		
	Significant Difference, 20: 1:					—	—		

(*Plant cane results reported in Sugar Bull. No. 5, p. 12.*)

P.O.J. 2878 is again outstanding. In the combined results for two crops it is closely followed by D. 4/28 (parents: S.C. 12/4 x D. 625) which is, in turn, closely followed by Diamond 10 whose position in the first ratoon list must be attributed to remarkably good juice. D 625, the old standard, has been severely beaten.

These canes experienced the same weather conditions as described for Field 5 W., above.

The alkaline heavy silt of Field 8 W., Sophia was described on p. 13 of *Sugar Bulletin* No. 5.

Sophia—Field 9. W.—First Ratoons.

Table XXX and Figure IX give the results obtained from Field 9 W., Sophia,

TABLE XXX.—**Results of a Variety Trial in Field 9 West, Sophia.**

1ST RATOONS, 11.75 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	P.O.J. 2878	29.51	15.07	7.11	87.9	4.46	107.47	G. 119	8.57
	D. 52/20	31.17	14.08	10.09	86.3	4.40	106.02	P.O.J. 2878	8.29
	G. 119	31.34	13.98	6.73	88.9	4.36	105.06	D. 895/22	8.23
	D. 895/22	27.74	14.24	6.66	89.1	3.96	95.42	D. 52/20	8.20
	D. 625	31.07	12.85	15.46	83.6	3.94	94.94	D. 625	7.95
	D. 548/21	31.54	11.89	12.69	84.3	3.77	90.84	D. 548/21	7.60
	Mean:					4.15	100.00		
	Standard Error:					—	—		
	Significant Difference, 20 : 1:					—	—		

(*Plant cane results reported in Sugar Bull. No. 5, p. 13.*)

As a first ratoon, P.O.J. 2878 led its two nearest competitors by a small margin due entirely to a superior sucrose content. In the combined results, it is exceeded only by G. 119 which is not consistent in its high yields (*cf.* Field 5. W., Sophia, and Field 11 T.L., Port Mourant, in this Bulletin, and Field 15 A.O.L., Port Mourant, on p. 38 of *Sugar Bulletin* No 5). D. 52/20 again surpassed D. 625, which came one from last of the varieties tried.

This trial experienced the same rainfall conditions as those described above under Field 5. W.

On p. 14 of *Sugar Bulletin* No. 5 will be found a description of the slightly acidic heavy silt of Field 9. W., Sophia.

FIRST RATOON VARIETY TRIALS REAPED IN BERBICE.

In Table XXXI will be found details of the reaping dates, layouts, etc., of the two first ratoon experiments reaped in Berbice.

TABLE XXXI.—**First Ratoon Variety Trials Reaped in Berbice.**

Estate.	Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
			Previous Reaping.	Reaping.	Varieties.	Replicates	
Port Mourant	11 T.L.	13.00	23.X.35	26.XI.36	9	6	Randomised Blocks
Blairmont	24 Rp.	11.25	19.XII.35	24.XI.36	4	6	Randomised Blocks.

Port Mourant—Field 11 T.L.—First Ratoons.

The results from Field 11 T.L., Port Mourant, are given in Table XXXII and Figure X.

TABLE XXXII.—**Results of a Variety Trial in Field 11 T.L., Port Mourant.**

1ST RATOONS, 13.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	D. 4/28	41.44	13.86	11.36	86.0	5.71	106.93	P.O.J. 2878	12.01
	D. 628/21	45.77	12.34	15.29	80.8	5.65	105.81	D. 11/28	11.96
	D. 309/21	42.81	13.08	7.59	84.9	5.53	103.56	D. 4/28	11.88
	P.O.J. 2878	41.30	13.23	9.75	85.0	5.47	102.43	D. 309/21	11.41
	G. 119	39.69	13.39	7.64	87.4	5.34	100.00	D. 628/21	11.24
	D. 11/28	43.29	12.26	9.65	84.6	5.28	98.88	Diamond 10	10.98
	D. 241/21	40.92	12.57	9.40	85.0	5.14	96.25	D. 625	10.67
	D. 625	41.37	12.19	14.54	82.4	5.07	94.94	G. 119	9.90
	Diamond 10	37.83	12.91	9.47	84.9	4.85	90.82	D. 241/21	9.07
	Mean:					5.34	100.00		
	Standard Error:					—	—		
	Significant Difference, 20: 1:					—	—		

(Plant cane results reported in Sugar Bull. No. 5, p. 17.)

D 4/28 (parents: S.C. 12/4 x D. 625), which heads the first ratoon list and was third in the combined results, also did fairly well in Field 8. W., Sophia. Depite a high glucose ratio, it showed the highest sucrose content and the second highest purity as a first ratoon. P.O.J. 2878 heads the combined results for two crops closely followed by D. 11/28 (parents: S.C. 12/4 x D. 625) which has given good results elsewere (*cf.* Field 24 Rp., Blairmont, in this Bulletin and Field 13 E., Uitvlugt, on p. 50 of *Sugar Bulletin* No. 5). D. 309/21 (parent: D. 625) and D. 628/21 (parent: D. 625) have previously given good results in Field 28 A.E., on this estate. In the present test they outyielded Diamond 10 and D. 625.

These canes experienced a drought for four months after the previous harvest, then four very wet months, followed, in turn, by four unusually dry ones.

The markedly acidic clay of Field 11 T. L., Port Mourant, has been discussed on Page 18 of *Sugar Bulletin* No. 5.

Blairmont—Field 24 Rp.—First Ratoons.

Table XXXIII and Figure X present the results obtained from the test in Field 24 Rp., Blairmont.

TABLE XXXIII.—**Results of a Variety Trial in Field 24 Rp., Blairmont.**

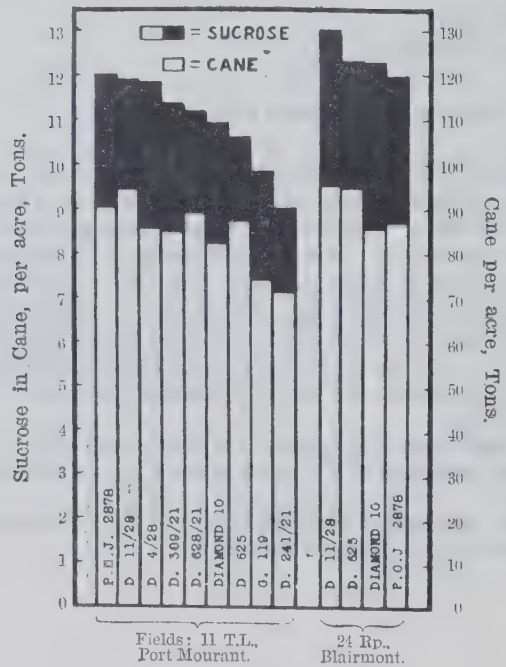
1ST RATOONS, 11.25 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	D. 11/28	45.24	14.12	8.70	86.1	6.39	115.14	D. 11/28	13.05
	D. 625	40.37	13.83	17.01	82.7	5.58	100.54	D. 625	12.37
	Diamond 10	33.94	15.20	7.85	87.5	5.16	92.97	Diamond 10	12.31
	P.O.J. 2878	36.55	13.94	8.38	86.0	5.09	91.71	P.O.J. 2878	11.96
	Mean:					5.55	100.00		
	Standard Error:					0.21	3.78		
	Significant Difference, 20 : 1:					0.63	11.35		

(*Plant cane results reported in Sugar Bull. No. 5, p. 19.*)

FIG. X.

Sucrose and Cane Yields from Plant Canes and First Ratoons at Pln. Port Mourant and Pln. Blairmont.



D. 11/28 (parents: S.C. 12/4 x D. 625), which has distinguished itself here, has several good performances to its credit and commercial trials with it on frontland soils having been advised, several estates have made extensions. Diamond 10 and P.O.J. 2878 were disappointing in this trial, and it is unfortunate that D. 927/22 (parent: D. 4399), which had been successful as a plant cane was so heavily damaged by rats, that it could not be weighed as a first ratoon.

Rains were short at first, but excessive after the first two months. The last three months before harvest were, however, very dry.

On p. 20 of *Sugar Bulletin* No. 5 will be found a description of the markedly acidic clay soil of Field 24 Rp., Blairmont.

First Ratoon Variety Trials Reaped in East Demerara.

Four first ratoon trials were reaped in East Demerara. Details of their layout, etc., are given in Table XXXIV.

TABLE XXXIV.—**First Ratoon Variety Trials Reaped in East Demerara.**

Estate.	Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
			Previous Reaping.	Reaping.	Varieties.	Replicates.	
Cane Grove	17 P.	12.00	8.IV.36	8.IV.37	2	7	Randomised Blocks.
Enmore	15 B.A.	12.50	15.IV.36	31.III.37	4	7	,,
Lusignan	40 W.	12.00	18.II.36	19.II.37	3	7	,,
LaBonne Intention	36 L.R.	11.50	15.IV.36	1.IV.37	3	7	,,

Cane Grove—Field 17 P.—First Ratoons.

The results from Field 17 P., Cane Grove, are shown in Table XXXV and Figure XI.

TABLE XXXV.—**Results of a Variety Trial in Field 17 P., Cane Grove.**

1st Ratoons, 12.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
Mean Yields:	D. 50/30	32.35	14.47	7.25	89.8	4.68	111.69	D. 50/30	9.92
	D. 625	29.39	12.59	19.40	80.9	3.70	88.31	D. 625	8.10
	Mean:					4.19	100.00		
	Standard Error:					0.23	5.49		
	Significant Difference, 20: 1:					0.80	19.09		

(Plant cane results reported in Sugar Bull, No. 5, p. 20.)

D. 50/30 (parents: D. 625 x S. C. 12/4), which outyielded D. 625 as a plant has again done so as a first ratoon. Its juice was distinctly superior to that of the standard in both instances.

The plant canes of this trial were harvested in heavy weather which persisted for about three months. The canes then had five months drier than usual, two wetter, and a drought for the last two months prior to harvest.

A desciption of the highly acidic pegassy clay of Field 17 P., Cane Grove, will be found on p. 21 of *Sugar Bulletin* No. 5.

Enmore—Field 15 B.A.—First Ratoons.

Table XXXVI and Figure XI show the results obtained from Field 15 B.A., Enmore.

TABLE XXXVI.—**Results of a Variety Trial in Field 15 B.A., Enmore.**

1ST RATOONS, 12.50 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	P.O.J. 2878	31.43	14.94	4.90	88.0	4.68	114.15	D. 927/22	10.20
	D. 927/22	34.34	13.27	7.92	86.0	4.55	110.98	P.O.J. 2878	10.00
	Diamond 10	26.49	15.56	4.14	90.3	4.12	100.49	Diamond 10	9.10
	D. 625	21.77	14.07	10.06	86.2	3.07	74.88	D. 625	7.36
	Mean:					4.10	100.00		
	Standard Error:					0.16	3.90		
	Significant Difference, 20: 1:					0.48	11.71		

(Plant cane results reported in Sugar Bull. No. 5, p. 22.)

The first ratoon sucrose contents and purities were good, D. 625 alone registering its unusually high glucose ratio.

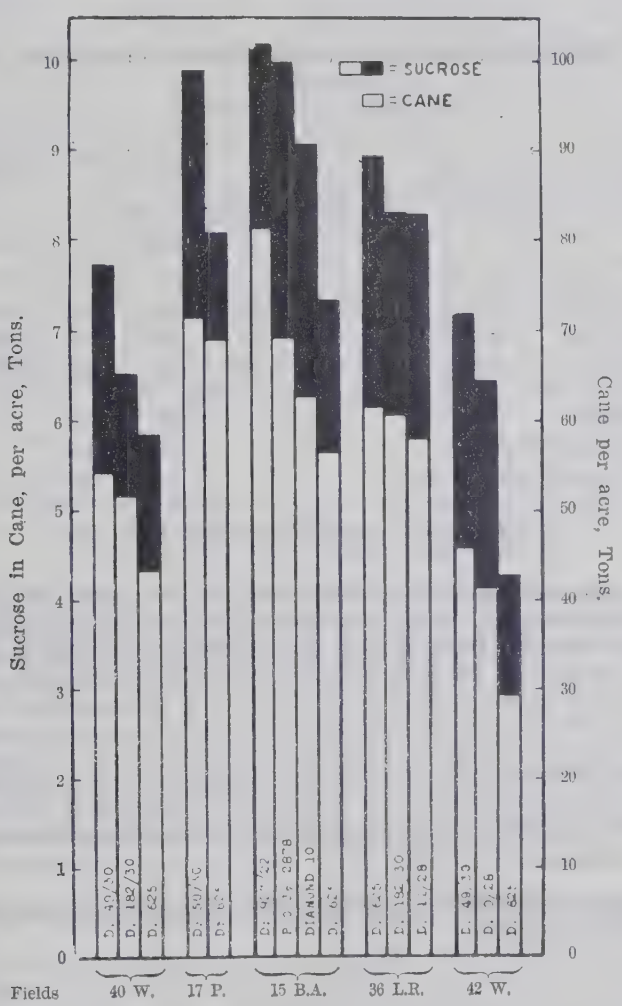
P.O.J. 2878 heads the first ratoon table but is second in the combined results, by a slight margin, to D. 927/22. Both of these canes are well above Diamond 10, which, in turn, leads D. 625 by a wide margin.

For the first three months after the previous harvest, rainfall was satisfactory. With the exception of one month, it was, however, rather deficient after that and a total of 11.33 in. less was registered than might have been expected.

On p. 23 of *Sugar Bulletin*. No. 5 will be found a discussion of the highly acidic clay soil of Field 15 B.A., Enmore.

FIG. XI.

Sucrose and Cane Yields from Plant Canes and First Ratoons, at Pln. Lusignan, Pln. Cane Grove, Pln. Enmore, Pln. La Bonne Intention and Pln. Uitvlugt.



Lusignan—Field 40 W.—First Ratoons.

The data from Field 40 W., Lusignan, are presented in Table XXXVII and Figure XI.

TABLE XXXVII.—**Results of a Variety Trial in Field 40 W., Lusignan.**

1ST RATOONS, 12.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	D. 49/30	24.58	13.97	6.28	88.3	3.43	128.95	D. 49/30	7.74
	D. 182/30	19.37	13.08	8.03	84.2	2.54	95.49	D. 182/30	6.55
	D. 625	15.39	13.13	11.39	83.2	2.02	75.94	D. 625	5.86
	Mean:					2.66	100.00		
	Standard Error:					0.12	4.51		
	Significant Difference, 20: 1:					0.37	13.91		

(*Plant cane results reported in Sugar Bull. No. 5, p. 23.*)

Three canes which headed the plant cane list have come out in the same order as first ratoons, with D. 49/30 (parent : D. 625) showing not only a higher tonnage but a distinctly superior juice than the standard cane, than which it was significantly better. D. 182/30 (parent : B. 6835 x D. 625) was also significantly better than D. 625 as a first ratoon and leads it by a wide margin in the combine results.

The ratoon spring of this was adversely affected by heavy rains which came in early and continued for five months after the plant cane harvest. Further excesses occurred later in the growth season and the total precipitation was 13.54 in. above the normal

The highly acidic fine silt of Field 40 W., Lusignan, is described on p. 24 of *Sugar Bullettin* No. 5.

La Bonne Intention—Field 36 L.R.—First Ratoons.

Table XXXVIII and Figure XI contain the results from Field 36 L.R., La Bonne Intention.

TABLE XXXVIII.—**Results of a Variety Trial in Field 36 L.R., La Bonne Intention.**

1ST RATOONS, 11.50 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	D. 625	23.33	15.24	9.77	86.8	3.57	103.78	D. 625	8.96
	D. 11/28	22.70	15.16	4.68	88.5	3.44	100.00	D. 182/30	8.34
	D. 182/30	23.45	14.13	5.65	86.8	3.31	96.22	D. 11/28	8.32
	Mean:					3.44	100.00		
	Standard Error:					...	...		
	Significant Difference, 20: 1:					...	...		

(Plant cane results reported in Sugar Bull. No. 5, p. 25.)

D. 625, the standard in this test, has led its two competitors by narrow margins as a first ratoon and by somewhat wider margins in the combined results for two crops. D. 11/28 (parents; S.C. 12/4 x D. 625) was not up to its usual standard in this Field.

These canes experienced heavy rainfall for four months after harvest, then a four months' drought. After two months of excessive precipitation there was another drought of two months duration before the canes were reaped.

A discussion of the markedly acidic heavy slit of Field 36 L.R., La Bonne Intention, appeared on p. 26 of *Sugar Bulletin* No. 5.

FIRST RATOON VARIETY TRIALS REAPED IN WEST DEMERARA.

Only one first ratoon trial, that in Field 42 W., Uitvlugt, was harvested during the period. There were three varieties arranged in seven randomised blocks. The field had been cut as plants on 20. III. '36 and was reaped as first ratoons on 16. III. '37.

Uitvlugt—Field 42 W.—First Ratoons.

The data from Field 42 W., Uitvlugt, are given in Table XXXIX and presented graphically in Figure XI.

TABLE XXXIX.—**Results of a Variety Trial in Field 42 W., Uitvlugt.**

	1st Ratoons, 12.00 months.								
	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
Mean Yields:	D. 49/30	26.25	15.85	4.80	91.2	4.15	121.70	D. 49/30	7.22
	D. 9/28	23.58	15.43	4.44	91.8	3.62	106.16	D. 9/28	6.47
	D. 625	16.82	14.55	9.34	87.3	2.45	71.85	D. 625	4.29
	Mean:					3.41	100.00		
	Standard Error:					0.12	3.52		
	Significant Difference, 20: 1:					0.37	10.85		

(*Plant cane results reported in Sugar Bull. No. 5, p. 27.*)

Both D. 49/30 (parent: D. 625) and D. 9/28 (parents: S.C. 12/4 x D. 625) were statistically better than D. 625 as first ratoons and they led the standard by a wide margin in the combined results. D. 49/30 is being given commercial consideration in certain districts.

The heavy rains which were falling at the time the plant canes were reaped continued for some months after but were followed by two drought periods separated by two months of excessive precipitation.

On p. 28 of *Sugar Bulletin* No. 5 will be found a description of the markedly acidic pegassy clay of Field 42 W., Uitvlugt.

SUB-SECTION C.—SECOND AND THIRD RATOON VARIETY TRIALS.

One second ratoon variety trial was reaped in Field 12 E., Sophia, and another in Field 22 C.M., La Bonne Intention; while a third ratoon test was reaped in Field 4 H., Blairmont, and one in Field 61 O., Ogle. Details as to their layout, reaping dates, etc., are given in Table XL.

Table XL.—**Second and Third Ratoon Variety Trials Reaped.**

Estate.	Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
			Previous Reaping.	Reaping.	Varieties.	Replicates.	
Sophia Experiment Station	12 E.	13.00	7.X.35	4.XI.36	2	5	Randomised Blocks.
La Bonne Intention	22 C.M.	11.00	30.XI.35	3.XI.36	4	6	,,
Blairmont	4 H.	11.50	14.XI.35	30.X. 36	4	7	,,
Ogle	61 O.	12.25	23.IX.35	30.IX.36	2	8	,,

Sophia—Field 12 E.—Second Ratoons.

The results of the experiment in Field 12 E., Sophia, are presented in Table XLI and Figure XII.

TABLE XLI.—**Results of a Variety Trial in Field 12 East, Sophia.**

2ND RATOONS, 13.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN	D. 625	19.57	15.17	8.02	86.9	2.95	114.34	D. 625	12.40
YIELDS:	D. 203/20	16.83	13.17	5.85	87.0	2.22	86.05	D. 203/20	10.40
	Mean:					2.58	100.00		
	Standard Error:					0.16	6.20		
	Significant Difference:					0.63	24.42		

(*Plant cane results reported in Sugar Bull. No. 4, p. 7.*)

(*First ratoon results reported in Sugar Bull. No. 5, p. 29.*)

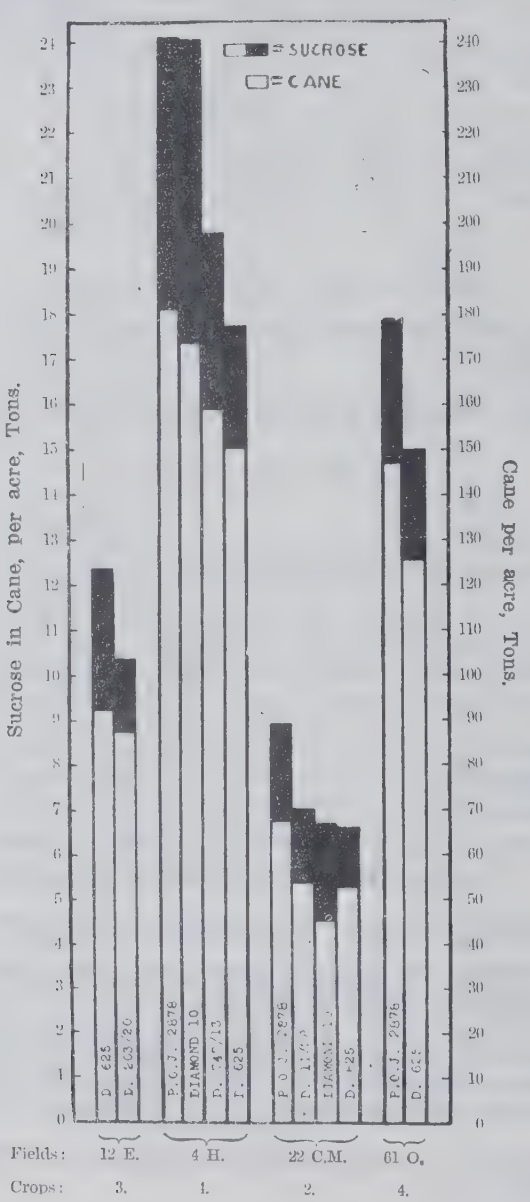
Only two varieties were reaped as second ratoons and D. 625, the standard, proved to be distinctly the better of the two.

In its early months of growth this trial was subject to sub-normal rainfall. On the other hand precipitation was excessive from the sixth to the eight month. It was, however, again deficient towards the end of the growth period.

The slightly acidic clay soils of Field 12 E., Sophia, were discussed on p. 9 of *Sugar Bulletin* No. 4.

FIG XII.

Sucrose and Cane Yields from all crops at Sophia, Pln. Blairmont Pln. La Bonne Intention and Pln. Ogle.



Blairmont—Field 4 H.—Third Ratoons.

Table XLII and Figure XII present the results of Field 4 H., Blairmont.

TABLE XLII.—Results of a Variety Trial in Field 4 H., Blairmont.

3RD RATOONS, 11.50 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 4 Crops, Plants, 1st, 2nd and 3rd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	Diamond 10	35.43	15.11	6.46	88.5	5.35	118.36	P.O.J. 2878	24.13
	P.O.J. 2878	36.15	13.87	7.48	86.9	4.96	109.73	Diamond 10	24.10
	D. 625	29.52	13.50	15.72	82.0	3.93	86.95	D. 747/13	19.85
	D. 747/13	27.93	13.79	11.39	85.6	3.84	84.96	D. 625	17.80
	Mean:					4.52	100.00		
	Standard Error:					0.25	5.53		
	Significant Difference, 20: 1:					0.74	16.37		

(Plant cane results reported in Sugar Bull. No. 3, p. 20.)

(First ratoon results reported in Sugar Bull. No. 4, p. 40.)

(Second ratoon results reported in Sugar Bull. No. 5, p. 42.)

As third ratoons Diamond 10 and P.O.J. 2878 are well ahead of D. 625 and D. 747/13. In the combined yields for four crops the two standard canes are practically tied with P.O.J. 2878 very slightly ahead. D. 747/13 (parent: D. 145) has given two tons of sucrose more than D. 625 in the four crops, but it has itself been far outdistanced by P.O.J. 2878 and Diamond 10.

Rainfall on the canes was short for the first four months, then excessive. The two months immediately preceding harvest were rather dry.

A discussion of the highly acidic pegassy clay of Field 4 H., Blairmont, will be found on p. 20 of *Sugar Bulletin* No. 3.

La Bonne Intention—Field 22 C.M.—Second Ratoons.

The results of the test in Field 22 C.M., La Bonne Intention, are shown in Table XLIII and Figure XII.

TABLE XLIII.—**Results of a Variety Trial in Field 22 C.M., La Bonne Intention.**

2ND RATOONS, 11.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 2nd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	P.O.J. 2878	21.56	15.63	5.49	89.4	3.38	111.92	P.O.J. 2878	8.95
	Diamond 10	19.13	16.20	4.24	90.6	3.10	102.65	D. 11/28	7.04
	D. 11/28	19.63	14.78	5.55	88.8	2.91	96.36	Diamond 10	6.71
	D. 625	19.74	13.62	10.24	85.5	2.68	88.74	D. 625	6.62
	Mean					3.02	100.00		
	Standard Error					0.14	4.64		
	Significant Difference, 20: 1:					0.42	13.91		

(*Plant cane results reported in Sugar Bull. No. 4, p. 22.*)

It was not possible to weigh this field as first ratoons, so that only plant cane and second ratoon results are available. The second ratoon juices were very satisfactory except in the case of D. 625 which came last at that reaping and also in the combined results. P.O.J. 2878 is outstanding and D. 11/28 has shown up better than Diamond 10.

Rainfall was deficient during the first three months, excessive during the next two, and high for three more. Droughty conditions then prevailed until the canes were harvested three months later.

The highly acidic clay soils of Field 22 C.M., La Bonne Intention, were described on p. 23 of *Sugar Bulletin* No. 4.

Ogle—Field 61 O.—Third Ratoons.

The data from Field 61 O., Ogle, are presented in Table XLIV and Figure XII.

TABLE XLIV.—**Results of a Variety Trial in Field 61 O., Ogle.**

3RD RATOONS, 12.25 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane. %	Glucose Ratio.	Purity.	Sucrose in Cane per Acre.		Combined Results for 4 Crops, Plants, 1st, 2nd and 3rd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane, per Acre Tons.
MEAN YIELDS :	P.O.J. 2878	33.51	13.12	7.13	85.5	4.38	105.04	P.O.J. 2878	17.97
	D. 625	29.06	13.64	11.99	84.0	3.96	94.96	D. 625	15.02
	Mean :					4.17	100.00		
	Standard Error :					—	—		
	Significant Difference, 1					—	—		

(*Plant cane results reported in Sugar Bull. No. 3, p. 24.*)
(*First ratoon results reported in Sugar Bull. No. 4, p. 42.*)
(*Second ratoon results reported in Sugar Bull. No. 5, p. 44.*)

Only two varieties were weighed as third ratoons. P.O.J. 2878 headed the list at this reaping and also in the combined results for four crops. Extensive commercial plantings of P.O.J. 2878 on this estate have largely justified themselves.

The fifth, eleventh and twelfth months of growth were rather dry, but during the other months it was usually over four inches with marked excesses above the normal at the sixth and seventh months.

The highly acidic fine silt soil of Field 61 O., Ogle, has been discussed on p. 24 of *Sugar Bulletin* No. 3.

SUB-SECTION D.—DISCUSSION AND SUMMARY OF RESULTS.

Tables XLV, XLVI, and XLVII summarise, respectively, the relative status of :—

(a) The varieties which have been reaped as plant canes, first ratoons, and second ratoons ;

(b) The varieties which have been reaped as plant canes, and first ratoons only ;

(c) The varieties which have been reaped as plant canes only.

TABLE XLV.—**Mean Sucrose Yields from Three Crops.**

Variety.	Mean Sucrose, Tons per acre (Corrected Values).				Total Yield, D. 625=100.0
	Plants.	First Ratoons.	Second Ratoons.	Total.	
P.O.J. 2753	4.68	5.15	5.34	15.17	133.89
Diamond 10	**5.15**	**4.21**	**4.30**	**13.66**	**120.56**
Co. 213	**4.95**	5.17	3.53	13.65	120.48
P.O.J. 2878	**5.38**	**4.55**	**3.64**	**13.57**	**119.77**
D. 9/28	**4.53**	*4.23*	4.06	12.82	113.15
D. 927/22	**4.97**	*4.60*	3.06	12.63	111.47
D. 309/21	*4.73*	3.87	3.86	12.46	109.97
P.O.J. 2727	*4.25*	*4.35*	3.81	12.41	109.53
D. 628/21	**4.87**	*4.05*	3.40	12.32	108.74
D. 747/13	**5.04**	4.14	2.87	12.05	106.35
S.W. 3	5.30	3.44	2.94	11.68	103.09
D. 11/28	**4.70**	**3.76**	*3.13*	11.59	102.29
D. 4/28	**4.62**	*3.65*	3.23	11.50	101.50
D. 207/20	*4.69*	3.83	2.88	11.40	100.62
D. 625	**4.68**	**3.69**	**2.96**	**11.13**	**100.00**
D. 241/21	**4.57**	*3.61*	3.14	11.32	99.91
D. 441/21	4.73	3.86	2.73	11.32	99.91
D. 895/22	**4.57**	*3.38*	2.91	10.86	95 85
D. 1/28	**4.28**	3.88	2.59	10.75	94.88
G. 119	**4.05**	*3.64*	3.00	10.69	94.35
D. 203/20	**4.32**	*3.36*	2.52	10.20	90.03
D. 195/17	*4.20*	3.40	2.20	9.80	86.50

NOTE :—**Heavy type indicates means of six or more tests ;**
Italics indicate means of three to five tests ;
Ordinary type indicates means of one or two tests

P.O.J. 2753 which heads the list, shows considerable promise but has not been tested sufficiently often as yet. It has already been put into some new trials.

Diamond 10 and P.O.J. 2878, which have been thoroughly tested, continue markedly to outyield the old standard and in most of the new trials one or other of these canes is used as a control rather than D. 625.

Co. 213 has been well tested as a plant cane and is undoubtedly a heavy yielder which should be tried on a small scale commercially while more ratoon experimental results are being accumulated.

D. 9/28, D. 927/22, D. 309/21, P.O.J. 2727 and D. 628/21 have all been fairly well tested except as second ratoons, for which more results will be available shortly. There remains but little doubt as to their definite superiority to D. 625, but unless further second ratoon yields are high, they are unlikely to replace Diamond 10 or P.O.J. 2878 generally, although some of them may have special merit in certain areas.

XLVI.—**Mean Sucrose Yields from Plant Canes and First Ratoons.**

Variety.	Mean Sucrose. Tons per acre (Corrected Values).			Total Yield, D. 625 = 100.0.
	Plants.	First Ratoons.	Total.	
D. 49/30	**4.87**	6.26	11.13	132.97
D. 66/30	**4.79**	5.51	10.30	123.06
P.O.J. 2878	**5.38**	**4.55**	**9.93**	**118.64**
Diamond 10	**5.15**	**4.21**	**9.36**	**111.83**
D. 178/29	5.48	4.54	9.12	108.96
T. 1198	*4.73*	4.31	9.04	108.00
D. 50/30	*4.76*	4.14	3.90	106.33
D. 182/30	*4.83*	3.86	8.69	103.82
D. 52/20	**4.91**	*3.74*	8.65	103.35
D. 69/29	5.42	3.22	8.64	103.23
D. 11/24	*4.99*	3.51	8.50	101.55
D. 64/30	*4.23*	4.18	8.41	100.48
D. 625	**4.68**	**3.69**	**8.37**	**100.00**
D. 219/30	*4.59*	3.78	8.37	100.00
D. 404/17	**4.74**	3.61	8.35	99.76
D. 19/30	4.34	3.99	8.33	99.52
B. 755	4.71	3.57	8.28	98.92
D. 548/21	*4.68*	3.51	8.19	97.85
B. 726	*4.18*	3.46	7.64	91.28
D. 134/27	*4.33*	3.24	7.57	90.44
D. 30/28	4.44	2.98	7.42	88.65
B. 417	4.65	2.54	7.19	85.90
D. 140/29	4.58	2.59	7.17	85.66
P.R. 820	*3.58*	3.45	7.03	83.99
D. 62/30	*4.07*	2.95	7.02	83.87
D. 18/29	*4.23*	2.50	6.73	80.41

NOTE :—**Heavy type indicates means of six or more tests ;**
Italics indicate means of three to five tests ;
Ordinary type indicates means of one or two tests.

D. 49/30 has been adequately tested as a plant cane but only two first ratoon results are available. As a plant it has been, on the average, superior to D. 625 but not so good as P.O.J. 2878 and Diamond 10; as a first ratoon, however, it has far surpassed all three of these varieties. Nothing more definite can be said until further ratoon results are available.

D. 66/30 also shows much promise and further ratoon results are awaited with interest.

D. 178/29, T. 1198, D. 50/30 and D. 182/30 will all be tested further.

TABLE XLVII.

Mean Sucrose Yields from Plant Canes.

Variety.	Mean Sucrose, Tons per acre (Corrected Values). Plants.	Yield, D. 625=100.0
M.P.R. 7	5.72	122.26
D. 67/30	5.65	120.72
D. 113/30	5.45	116.48
P.O.J. 2878	**5.38**	**114.86**
D. 75/30	5.37	114.68
D. 205/30	5.28	112.82
D. 173/30	5.21	111.23
Diamond 10	**5.15**	**110.12**
F.C. 916	5.12	109.38
D. 235/30	5.04	107.77
D. 147/30	4.99	106.54
M.P.R. 42	4.94	105.65
D. 164/30	4.86	103.84
D. 150/30	4.85	103.61
D. 1/31	4.82	103.07
D. 81/30	4.82	103.07
M.P.R. 44	4.79	102.32
D. 2/31	4.78	102.16
D. 151/30	4.73	101.05
F.C. 998	4.71	100.58
D. 625	**4.68**	**100.00**
D. 167/30	4.67	99.85
D. 39/30	4.64	99.15
D. 165/30	4.60	98.31
M.P.R. 49	4.57	97.62
D. 232/30	4.53	96.77
D. 87/27	4.52	96.57
D. 137/29	4.45	95.06
D. 170/30	**4.40**	93.92
D. 57/27	**4.33**	92.48
D. 78/30	4.32	92.33
D. 71/30	4.26	90.95

TABLE XLVII.

Mean Sucrose Yield from Plant Canes—(Contd.).

Variety.	Mean Sucrose, Tons per acre (Corrected Values). Plants.	Yield, D. 625=100.0
D. 88/30	*4.24*	90.58
D. 103/30	*4.23*	90.32
D. 79/30	*4.20*	89.81
D. 22/28	4.14	88.52
D. 541/22	4.13	88.26
D. 171/29	*4.12*	87.94
D. 11/32	4.11	87.82
M.P.R. 145	4.08	87.21
D. 284/27	4.03	86.20
D. 51/30	**4.01**	85.77
P.R. 807	4.01	85.73
P.R. 826	*3.97*	84.80
P.R. 803	3.94	84.25
D. 135/30	*3.92*	83.67
D. 127/30	3.90	83.27
D. 36/23	3.88	82.91
D. 84/30	*3.82*	81.71
M.P.R. 151	*3.70*	79.14
D. 83/17	3.68	78.73
D. 60/30	*3.66*	78.31
D. 426/21	3.64	77.82
D. 24/30	*3.62*	77.41
T. 2020	*3.25*	69.44

NOTE:—**Heavy type indicates means of six or more tests;**

Italics indicate means of three to five tests;

Ordinary type indicates means of one or two tests.

It will be seen that most of the best seedlings of the 1930 group have now been tested as plant canes in three experiments. It is gratifying to note the high positions of D. 67/30, D. 113/30, D. 75/30, D. 205/30 and D. 173/30. Further plant cane and some first ratoon data from these canes will be available for the next Bulletin.

M.P.R. 7 has given one outstanding return. It will have to be tested again. Further consideration will also be given to F.C. 916, D. 235/30 and D. 147/30.

Briefly, the present position of the variety work is that:

(a) All the Demerara seedlings bred prior to the re-organisation of the Station have now been fairly well tested, except that more second ratoon results are desirable. Subject to this exception, it seems clear that D. 9/28, D. 927/22, D. 309/21 and D. 628/21 could have replaced D. 625 with advantage. With the spread of Diamond 10 and P.O.J. 2878, however, it is unlikely that they will be much extended unless some of them subsequently give much better second ratoon returns than their first trials indicate.

(b) None of the newer seedlings has been tested in second ratoons and only a few partially tested as first ratoons. In this latter group, however, D. 49/30 and D. 66/30 show considerable promise and D. 178/29, D. 50/30 and D. 182/30 seem worthy of further consideration. Several tests with D. 67/30, D. 113/30, D. 75/30, D. 205/30 and D. 173/30 prove that they are consistently high yielders as plant canes. Their behaviour as ratoons is being investigated.

(c) Most of the imported canes fail in this Colony. An outstanding exception has been P.O.J. 2878; Co. 213 promises to be another. P.O.J. 2753, P.O.J. 2727, M.P.R. 7, F.C. 916, M.P.R. 42 and T. 1198 merit further testing.

(d) Some estates have already made extensions of Co. 213, D. 49/30 and D. 66/30. This work should be expedited in all districts.

(e) Nurseries should be started with D. 178/29, D. 50/30, D. 67/30, D. 75/30, D. 205/30, D. 173/30, P.O.J. 2753, T. 1198, M.P.R. 7, and F.C. 916. Planting material is available and it is suggested that each manager choose five among these canes and apply for cuttings.

MANURIAL TRIALS.

This section deals with the results of twenty-one manurial trials reaped during the year ending June 30th, 1937. The arrangement of the section is similar to that followed in other *Bulletins*.

During the year three complex trials involving graded applications, singly and in combination, of nitrogenous, phosphatic and potassic fertilisers were reaped. The results of these trials are considered in the appropriate sub-sections.

Samples of cane, collected from each plot of each experiment, have been carefully examined in the laboratory at the Sophia Experiment Station. The results continue to show the advisability of conducting these tests when manurial requirements are being considered.

SUB-SECTION A.—EXPERIMENTS WITH NITROGENOUS MANURES.

(A1—A2) Sulphate of Ammonia on Flood-Fallowed Frontland (Plant Canes, P.O.J. 2878).

These two trials form part of a chain of complex experiments designed to investigate the effects of adequate applications of phosphatic and potassic manures in combination with heavy dressings of sulphate of ammonia. The experiments include dressings of sulphate of ammonia at 2 cwt., 4 cwt., and 6 cwt. per acre, superphosphate of lime at 0 cwt., 3 cwt., and 6 cwt. per acre and sulphate of potash at 0 cwt., 2 cwt., and 4 cwt. per acre.

(A1) Field No. 81 R.H., Rose Hall.

The topsoil of Field 81, R.H., Rose Hall, is a markedly acidic clay overlying a slightly acidic clay subsoil. The organic matter content of the topsoil is below the average, that of the subsoil is above the normal. The carbon : nitrogen ratio of the topsoil is normal, that of the subsoil is wide. The salinity of the topsoil is moderate, that of the subsoil is fairly high.

For the first month after planting it was markedly drier than usual. Then followed four months when precipitation was excessive, two, when it was ample, and three droughty months. Two months before harvest rainfall was again excessive, but it was nearly normal during the last month of growth. The cane was of good quality.

In this experiment applications of sulphate of ammonia at rates in excess of 2 cwt. per acre had no definite effect on the yield of cane, the sucrose content of the cane, or on the juice purity. This result confirms those of previous trials which indicated that plant canes of P.O.J. 2878 grown on flood-fallowed frontland should receive sulphate of ammonia at the rate of 2 cwt. per acre.

The only definite effect on the plant cane crop is an interaction between sulphate of ammonia and superphosphate as regards the glucose ratio. The results are shown in Table XLVIII.

The general mean figures for the experiment were :—

Tons cane per acre	53.48
Sucrose per cent. cane	13.34
Juice purity	87.3
Glucose ratio	5.17

TABLE XLVIII.

Interaction of Sulphate of Ammonia and Superphosphate of Lime on Plant Canes of P.O.J. 2878 on Flood-Fallowed Frontland.

Glucose Ratio.

	Low Nitrogen	High Nitrogen
High phosphate	4.42	5.97
No phosphate	7.34	5.07
Difference due to high phosphate	−2.92	+0.90
Significant difference (20: 1)=	2.32	

'Z' value obtained for interaction	...	...	=0.9131
'Z' value required for P=0.05	...	...	=0.7568

In the presence of light dressings of sulphate of ammonia, applications of superphosphate reduce the glucose ratio. In the presence of heavy dressings of sulphate of ammonia, applications of superphosphate increase the glucose ratio.

It is expected that more marked differences will be obtained with the ratoon crops of this experiment.

(A2) Field No. 26 Rp., Pln. Blairmont.

The topsoil of Field No. 26 Rp., Pln. Blairmont, is a markedly acidic clay overlying a slightly acidic clay subsoil. The organic matter content of the topsoil is above the average, that of the subsoil is below the normal. The carbon : nitrogen ratio of the topsoil is normal, that of the subsoil is narrow. The salinity of the topsoil is moderate, that of the subsoil is fairly high.

With rather dry weather for the first three months and excessive rains for the next three, these canes experienced abnormal weather at first. The rainfall of the later months was, however, closer to what might have been expected. The cane was of good quality.

The effect of increasing applications of sulphate of ammonia is shown in Table XLIX and shown graphically in Figure XIII.

The general mean value for the sucrose content of the cane was 13.78%, that of the glucose ratio was 7.90.

TABLE XLIX.

Effect of Sulphate of Ammonia on Plant Canes of P.O.J. 2878 on Flood-Fallowed Frontland.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, Tons/acre.	Juice Purity.
2	44.85	6.180	84.6
4	42.45	5.850	84.0
6	41.51	5.720	83.2
Means.	42.94	5.917	83.9
S.E. of means	0.77	0.106	0.2
Significant Differences (20 : 1)	2.32	0.320	0.7

'Z' value obtained for effect of nitrogen on tonnage ... =1.1159
" " " " " " " juice purity ... =1.4664
" " required for P=0.01 ... ... =1.0807

Applications of sulphate of ammonia at rates in excess of 2 cwt. per acre depressed the yield of cane and sucrose and had an adverse effect on the juice purity. They were without definite effect on the sucrose content of the cane and the glucose ratio. These results confirm previous findings.

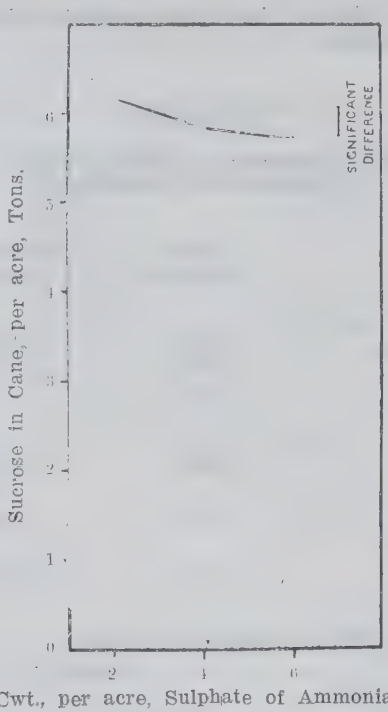


FIG. XIII.

Effect of Sulphate of Ammonia on Flood-Fallowed Frontland (P.O.J. 2878: Plant Canes).

A definite interaction between sulphate of ammonia and superphosphate, similar to that obtained with the glucose ratio in the preceding experiment, was noted as regards the juice purity. The results are shown in Table L.

TABLE L.

Interaction of Sulphate of Ammonia and Superphosphate of Lime on Plant Canes of P.O.J. 2878 on Flood-Fallowed Frontland.

Juice Purity.

	Low Nitrogen	High Nitrogen
High phosphate	85.3	83.0
No phosphate	84.3	83.8
Difference due to high phosphate	+1.0	−0.8
Significant Difference (20 : 1)≒	1.23	

'Z' value obtained for interaction ... ... =0.7715
„ „ required for P=0.05 ... ... =0.7568

With *small* applications of sulphate of ammonia a beneficial effect on juice purity is noted with applications of superphosphate. With *large* applications of sulphate of ammonia an adverse effect on juice purity is noted with applications of superphosphate.

A definite interaction between sulphate of ammonia and sulphate of potash was noted as regards the glucose ratio. The results are shown in Table LI.

TABLE LI.

Interaction of Sulphate of Ammonia and Sulphate of Potash on Plant Canes of P.O.J. 2878 on Flood-Fallowed Frontland.

Glucose Ratio.

	Low Nitrogen	High Nitrogen
High Potash	7.84	7.49
No Potash	6.69	9.27
Difference due to high potash	+1.15	−1.78

Significant Difference (20 : 1) = 1.23

'Z' value obtained for interaction ... ... =0.9299
„ „ required for P=0.05 ... ... =0.7568

With a *small* dressing of sulphate of ammonia applications of sulphate of potash increased the glucose ratio. With a *large* dressing of sulphate of ammonia applications of sulphate of potash reduced the glucose ratio.

In general the results of these two experiments confirm previous findings regarding the nitrogen requirements of plant canes of P.O.J. 2878 on flood-fallowed frontland. In addition they emphasise the effects of phosphatic and potassic fertilisers in conjunction with nitrogenous fertilisers on the ripeness of cane. With heavy dressings of sulphate of ammonia heavy applications of phosphates impair the quality while with light dressings of sulphate of ammonia heavy applications of phosphates improve the quality of the cane. Sulphate of potash has the reverse effect. With heavy dressings of sulphate of ammonia heavy applications of potash improve the quality while with light dressings of sulphate of ammonia heavy applications of potash impair the quality of the cane.

These experiments are being continued and it is probable that more interesting results will be obtained with subsequent crops.

(A3—A4) Sulphate of Ammonia on Flooded Frontland (First Ratoons, P.O.J. 2878).

(*Plant cane results reported in Sugar Bull. No. 5, pp. 72—75.*)

These two trials constitute a part of a chain of 4 x 4 latin squares designed to determine the nitrogen requirements of first ratoons of P.O.J. 2878 growing on flooded frontland soils.

The individual results of the two trials, each consisting of three 4 x 4 latin squares, are given in Table LII.

Table LII.

Effect of Sulphate of Ammonia on First Ratoons of P.O.J. 2878 on Flood-Fallowed Frontland.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
	Pln. Skeldon, Field 8 Springlands.				
0	26.90	13.42	3.610	86.5	8.59
2	31.23	14.69	4.588	88.7	7.32
4	35.29	14.58	5.145	88.0	7.29
6	37.48	14.08	5.277	86.3	8.29
Means	32.72	14.19	4.655	87.4	7.87
	Pln. Ogle, Field 45 Ogle.				
0	21.14	14.15	2.991	86.2	7.01
2	30.67	14.38	4.410	85.8	7.65
4	36.32	14.08	5.114	84.8	8.47
6	39.10	13.74	5.372	83.8	9.74
Means	31.81	14.09	4.472	85.2	8.22

At Pln. Skeldon, immediately after harvest these canes had one very wet month, then four months of unusually dry weather. The sixth month was unusually wet, but, despite slight fluctuations from the normal, the weather after that may be considered satisfactory. The cane was of good quality.

At Pln. Ogle, immediately after the previous harvest the rainfall was normal, but tended to be deficient from the second to the fifth month of growth. The sixth and seventh months were much wetter than usual, and the eleventh much drier. The cane was of good quality.

The results of these two experiments have been combined with those of the two experiments in Field No. 8, Eliza and Mary, Pln. Skeldon and Field No. 26 West, Pln. Lusignan, reported in *Sugar Bull.* No. 5, pp. 75-78. The combined results of these twelve 4 x 4 latin squares are presented in Table LIII and shown graphically in Figure XIV.

TABLE LIII.

Effect of Sulphate of Ammonia on First Ratoons of P.O.J. 2878 on Flood-Fallowed Frontland.

(Combination of Four Experiments.)

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	22.07	14.00	3.090	86.4	7.46
2	29.95	14.48	4.337	87.3	6.97
4	35.38	14.42	5.102	86.6	7.79
6	38.42	14.02	5.386	85.4	8.77
Means	31.46	14.23	4.479	86.4	7.75
S.E. of means	0.61	0.11	0.087	0.2	0.25
Significant Differences (20 : 1)	1.76	0.32	0.250	0.6	0.72

'Z' value obtained for effect of nitrogen on tonnage .... =2.4599
" " " " " " " " sucrose content =0.8310
" " " " " " " " juice purity =1.3432
" " " " " " " " glucose ratio =1.4375
" " required for P=0.01 ..... =0.7086

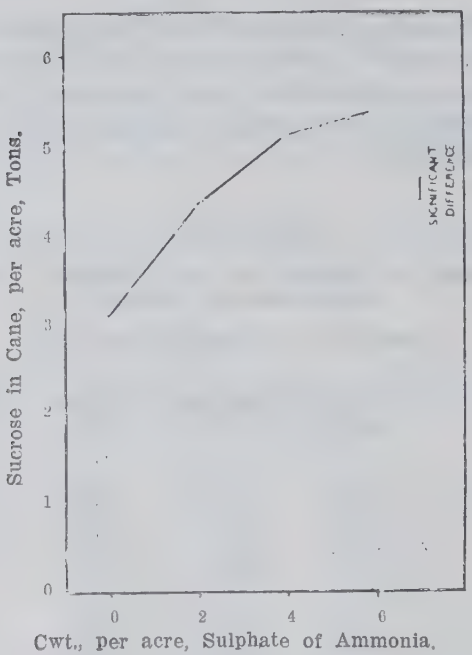


FIG. XIV.

Effect of Sulphate of Ammonia on Flood-Fallowed Frontland (P.O.J. 2878: First Ratoons).

Conclusions:—Under the conditions of the experiments:—

(a) The effect of environment, age of cane and season have had a very marked effect on the tonnage, the sucrose content, the juice purity and on the glucose ratio.

(b) As far as tonnage is concerned, increasing doses of sulphate of ammonia are responsible for increased yields. An application at the rate of 2 cwt. per acre gives an increase of 7.88 tons of cane per acre (25.0 per cent. of the mean). An application at the rate of 4 cwt. per acre gives an increase of 13.31 tons per acre (42.3 per cent. of the mean) while an application at the rate of 6 cwt. per acre gives an increase of 16.35 tons per acre (52.0 per cent. of the mean). The applications of sulphate of ammonia had similar effects on the different areas of soil or under different climatic conditions.

(c) The treatments had a very marked and unusual effect on the sucrose content of the cane. Applications of sulphate of ammonia at the rate of 2 cwt. and 4 cwt. per acre gave sweeter cane than that

obtained with no sulphate of ammonia or with an application at the rate of 6 cwt. per acre. The applications had similar effects on the different areas of soil or under differing climatic conditions.

(d) As compared with the juice purity obtained on the control plots an application at the rate of 2 cwt. per acre of sulphate of ammonia had the unusual effect of improving the purity. An application at the rate of 4 cwt. per acre had no effect while an application at the rate of 6 cwt. per acre caused a definite drop in purity. The applications had similar effects on the different areas of soil or under differing climatic conditions.

(e) An application at the rate of 6 cwt. per acre of sulphate of ammonia had a definite adverse effect on ripening as evidenced by the values for the glucose ratio. The applications had similar effects on different areas of soil or under differing climatic conditions.

(f) The most important economic value is the yield of sucrose per acre. An application at the rate of 2 cwt. per acre gives an increase of 1.247 tons of sucrose per acre (27.8 per cent. of the mean). An application at the rate of 4 cwt. per acre gives an increase of 2.012 tons of sucrose per acre (44.9 per cent of the mean). An application at the rate of 6 cwt. per acre gives an increase of 2.296 tons of sucrose per acre (51.3 per cent. of the mean).

(A5—A6) Effect of Sulphate of Ammonia on Second Ratoons of P.O.J. 2878 on Flood-Fallowed Frontland.

(*First Ratoon results reported in Sugar Bull. No. 5, pp. 75—78.*)

These two trials constitute part of a chain of experiments designed to determine the nitrogen requirements of second ratoons of P.O.J. 2878 growing on flood-fallowed frontland.

The results obtained in the individual experiments are presented in Table LIV.

TABLE LIV.

Effect of Sulphate of Ammonia on Second Ratoons of P.O.J. 2878 on Flooded-Fallowed Frontland.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose, Ratio.
	Pln. Skeldon, Field 8 Eliza and Mary.				
2	26.58	14.32	3.806	85.7	7.15
4	30.48	14.06	4.285	85.1	8.20
6	31.24	13.42	4.192	84.4	8.43
8	31.42	13.17	4.138	83.6	8.90
Means	29.93	13.74	4.105	84.7	8.17
	Pln. Lusignan, Field 26 West, Lusignan.				
2	21.36	14.80	3.161	87.6	3.94
4	28.07	14.94	4.194	87.6	3.91
6	30.37	14.49	4.401	87.6	3.91
8	33.27	14.82	4.931	87.3	3.69
Means	28.27	14.76	4.172	87.5	3.86

At Pln. Skeldon, immediately after harvest these canes had one very wet month, then four months of unusually dry weather. The sixth month was unsually wet, but, despite slight fluctuations from the normal, the weather after that may be considered satisfactory. The cane was of good quality.

At Pln. Lusignan the rainfall was somewhat better than usual during the first four months of growth, but subnormal during the next three. The eighth and ninth months were much wetter than usual, the last three months rather dry. The cane was of very good quality.

The combined results of these two experiments are presented in Table LV. and shown graphically in Figure XV.

TABLE LV.

Effect of Sulphate of Ammonia on Second Ratoons of P.O.J. 2878 on Flood-Fallowed Frontland (Combination of two Experiments).

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose, Ratio.
2	23.97	14.52	3.480	86.5	5.87
4	29.27	14.41	4.218	86.1	6.48
6	30.77	13.85	4.262	85.7	6.62
8	32.35	13.83	4.474	85.0	6.82
Means	29.09	14.15	4.108	85.8	6.45
S.E. of Means	0.72	0.21	0.102	0.3	...
Significant Differences (20 : 1)	2.17	0.61	0.307	0.9	...

'Z' value obtained for effect of nitrogen on tonnage ... =1.6142
" " " " " " " " sucrose content =0.5569
" " " " " " " " juice purity =0.6885
" " required for P=0.05 ..... =0.5362
" " " " P=0.01 ..... =0.7531

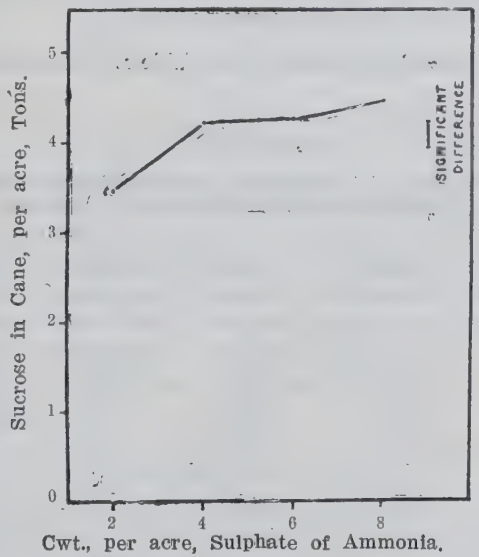


FIG. XV.

Effect of Sulphate of Ammonia on Flood-Fallowed Frontland (P.O.J. 2878: Second Ratoons).

Conclusions :—Under the conditions of the experiments :—

(a) Increasing doses of sulphate of ammonia lead to definite increases in yield of cane. Such increases are, however, accompanied by reductions in the sucrose content of the cane.

(b) As regards the yield of sucrose an application of sulphate of ammonia at the rate of 4 cwt. per acre gives an increase of 0.738 tons of sucrose per acre over that obtained with a dressing at the rate of 2 cwt. per acre. Heavier dressings at the rate of 6 cwt. and 8 cwt. per acre produce *no* definite increase over the yield obtained with the 4 cwt. dressing.

(c) Heavier dressings depressed the values for the juice purity but were without effect on the glucose ratio.

(A7) Sulphate of Ammonia on Flood-Fallowed Frontland (Second Ratoons, Diamond 10).

(First ratoon results reported in Sugar Bull. No. 5, pp. 79-81.)

Immediately after harvest these canes had one very wet month, then four months of unusually dry weather. The sixth month was unusually wet, but, despite slight fluctuations from the normal, the weather after that may be considered satisfactory. The cane was of good quality.

The results obtained are presented in Table LVI. and shown graphically in Figure XVI.

Table LVI.

Effect of Sulphate of Ammonia on Second Ratoons of Diamond 10 on Flood-Fallowed Frontland at Pln. Skeldon.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	23.31	15.12	3.459	86.2	7.74
2	25.65	14.73	3.806	86.1	9.17
4	29.19	14.91	4.332	86.0	8.87
6	29.73	14.60	4.412	85.0	9.18
Means	26.97	14.84	4.002	85.8	8.74
S.E. of means	0.95	...	0.14	0.2	...
Significant Differences (20 : 1)	2.77	...	0.41	0.7	...

'Z' value obtained for effect of nitrogen on tonnage ..... =1.1641
" " " " " " " " juice purity ..... =0.7883
" " required for P=0.05 ..... =0.5753
" " " " P=0.01 ..... =0.8138

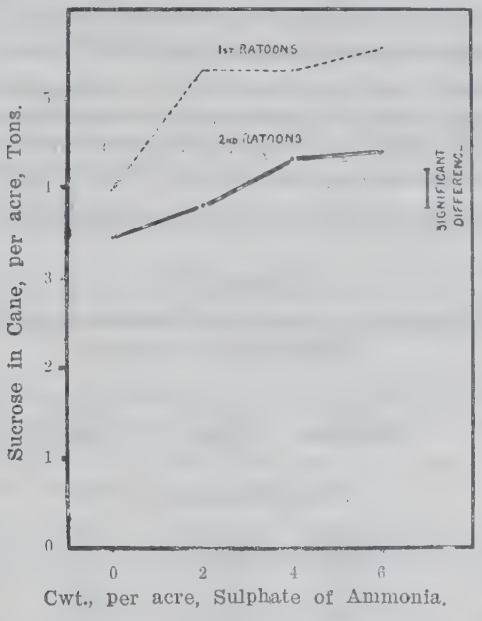


FIG. XVI.

Effect of Sulphate of Ammonia on Flood-Fallowed Frontland (Diamond 10: First and Second Ratoons).

Conclusions:—Under the conditions of the experiment:—

(a) An application of sulphate of ammonia at the rate of 2 cwt. per acre had no definite effect on the yield of cane. An application at the rate of 4 cwt. per acre gave a definite increase in yield over that obtained with the 2 cwt. application. A dresssing at the rate of 6 cwt. per acre had no further effect.

(b) The treatments had no definite effect on the sucrose content of the cane.

(c) The effects of the treatments on the yield of sucrose per acre were identical with those on the yield of cane.

(d) Dressings of sulphate of ammonia at 2 cwt. and 4 cwt. per acre had no effect on the juice purity. An application at the rate of 6 cwt. per acre had a depressing effect.

(e) The treatments were without effect on the glucose ratio.

(A8—A10) Sulphate of Ammonia on Flood-Fallowed Frontland (Third Ratoons, D. 625).

(Plant cane results reported in Sugar Bull. No. 3, pp. 79—84.)

(First ratoon results reported in Sugar Bull. No. 4, pp. 75—79.)

(Second ratoon results reported in Sugar Bull. No. 5, pp. 61—66.)

These three trials constitute a chain of 4 x 4 latin squares designed to determine the optimum dressing of sulphate of ammonia for the variety D. 625 growing on flood-fallowed frontlands. The third ratoon plots were given the same doses of sulphate of ammonia as they received in previous crops.

The individual results of the three trials are presented in Table LVII.

Table LVII.

Effect of Sulphate of Ammonia on Third Ratoons of D. 625 on Flood-Fallowed Frontland.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
	Pln.	*Rose Hall, Field 30*		*Rose Hall.*	
0	14.23	13.70	2.05	88.2	8.88
2	13.96	14.98	2.01	88.6	9.01
4	15.67	14.13	2.25	87.0	8.91
6	17.06	14.75	2.45	87.1	8.76
Means	15.23	14.39	2.19	87.7	8.89
	Pln. Enmore, Field 8		*Bachelor's Adventure.*		
0	15.68	13.09	2.05	84.5	8.94
2	23.26	13.28	3.04	84.3	9.84
4	30.70	13.44	4.02	83.4	9.52
6	32.69	12.55	4.28	81.9	11.47
Means	25.59	13.09	3.35	83.5	9.94
	Pln.	*Lusignan, Field 85*		*Mon Repos.*	
0	8.25	14.04	1.12	85.4	11.99
2	10.75	13.99	1.46	85.8	10.47
4	11.59	13.25	1.57	85.4	11.30
6	14.90	13.00	2.02	83.2	13.55
Means	11.37	13.57	1.54	85.0	11.83

The rainfall experienced at the various centres is described in the following paragraphs.

At Rose Hall, four months of excessive precipitation followed the previous harvest. These were, in turn followed by two months when it was satisfactory and three when it was rather dry. Two months before harvest rainfall was again excessive, but it was nearly normal during the last month of growth. The cane was of good quality.

At Enmore, the experiment was adversely affected by unusually heavy rains during the two months following the previous harvest and normal but heavy rains for the next two. The fifth to the seventh and the ninth months of growth were drier than usual, but the precipitation of the remaining months were reasonably close to the mean. The cane was of good quality.

At Lusignan, the fifth and twelfth months of growth were unusually dry, but during the rest of its period of growth this field experienced ample or, in the case of two months (the first and ninth), excessive rainfall. The cane was of fair quality.

The combined third ratoon results of the three latin squares are presented in Table LVIII and are shown graphically in Figure XVII where the results of previous crops are included for comparison.

TABLE LVIII.

Effect of Sulphate of Ammonia on Third Ratoons of D. 625 on Flood-Fallowed Frontland (Combination of Three Experiments).

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice, Purity.	Glucose, Ratio.
0	12.72	13.61	1.740	86.1	9.94
2	15.99	14.08	2.187	86.2	9.77
4	19.32	13.61	2.642	85.3	9.91
6	21.55	13.43	2.947	84.1	11.26
Means	17.39	13.68	2.379	85.4	10.22
S.E. of means.	2.04	—	0.279	—	—
Significant Differences (20 : 1)	7.06	—	0.966	—	—

'Z' value obtained for effect of nitrogen on tonnage ... =1.8013
" " " " " " " " sucrose content ... =0.4453
" " " " " " " " juice purity ... =0.4031
" " " " " " " " glucose ratio ... =0.4635
" " required for P=0.05 ... =0.5753
" " " " P=0.01 ... =0.8138

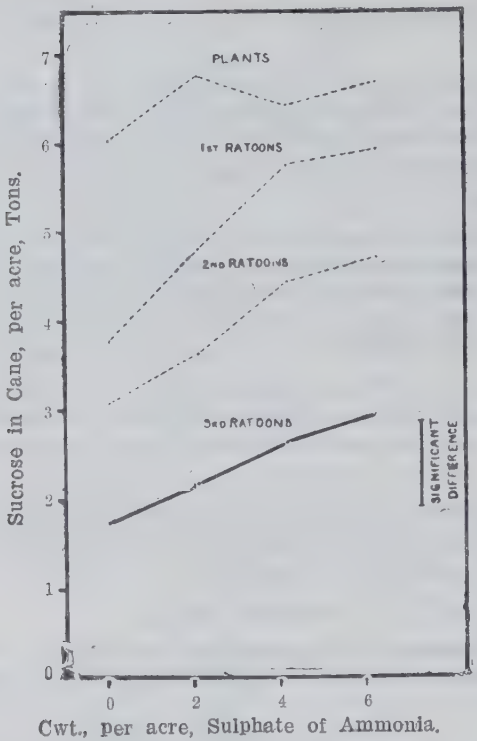


FIG. XVII.

Effect of Sulphate of Ammonia on Flood-Fallowed Frontland (D. 625: Plants, First, Second, and Third Ratoons).

Conclusions :—The following general conclusions, referring to third ratoons of D. 625 on flood-fallowed frontland soils, may be drawn from these results:—

(a) Increasing doses of sulphate of ammonia give increasing yields of cane and sucrose.

(b) Increasing doses of sulphate of ammonia have no definite effect upon the sucrose content of the cane, the juice purity or the glucose ratio.

(A11) SULPHATE OF AMMONIA ON PEGASSY CLAY (PLANT CANES, P.O.J. 2878).

The experiment is one of a chain of complex fertiliser trials on pegassy clay designed to investigate the effect of heavy applications of sulphate of ammonia in conjunction with various combinations of sulphate of potash and basic slag.

The trial was conducted in Field No. 31 East, Pln. Uitvlugt. The topsoil is a markedly acidic pegassy clay overlying a highly acidic clay subsoil. The organic matter content of the topsoil is above the average, that of the subsoil is below normal. The carbon : nitrogen ratio of both topsoil and subsoil is narrow. The salinity of the topsoil is moderate, that of the subsoil low.

Two very wet months followed planting, but the rainfall of the next seven months was subnormal, though it may be considered to have been ample during the first three of these. December 1936 and January 1937 were unusually wet, but the next two months, which immediately preceded harvest, were correspondingly dry. The cane was of fair quality.

The general mean analytical figures were :—

Sucrose per cent. cane	14.64
Juice Purity	85.5
Glucose ratio	11.25

The results obtained are presented in Table LIX and are shown graphically in Figure XVIII.

TABLE LIX.

Effect of Sulphate of Ammonia on Plant Canes of P.O.J. 2878 on Pegassy Clay at Pln. Uitvlugt.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, Tons/acre.
6	21.10	3.089
8	22.91	3.354
10	26.72	3.912
Means	23.58	3.452
S.E. of means	1.61	0.236
Significant Differences (20 : 1)	4.63	0.678

'Z' value obtained for effect of nitrogen on tonnage .... =0.9018

'Z' „ required for P = 0.05 .... =0.7568

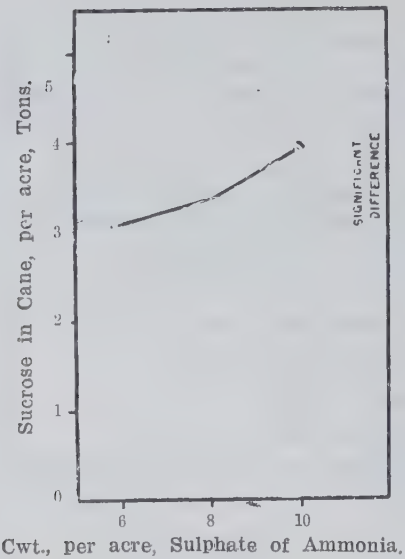


FIG. XVIII.

Effect of Sulphate of Ammonia on Pegassy Clay (P.O.J. 2878: Plant Canes).

Conclusions :—Under the conditions of the experiment :—

(a) A heavy application of sulphate of ammonia produces a definite increase in yield of cane and sucrose.

(b) Heavy applications of sulphate of ammonia have no definite effect on the sucrose content, juice purity or glucose ratio.

Previous experiments with sulphate of ammonia on pegassy clay soils have indicated the necessity of giving applications at the rate of 6 cwt. per acre if substantial increases are to be obtained. The present experiment was designed to investigate the effects of still heavier dressings in conjunction with phosphatic and potassic manures.

(A12) SULPHATE OF AMMONIA ON PEGASSY CLAY (SECOND RATOONS, D. 625).

(*Plant cane results reported in Sugar Bull. No. 3, pp. 97-100 and No. 4, pp. 80-84.*)

(*First ratoon results reported in Sugar Bull. No. 4, pp. 84-89 and No. 5, pp. 67-68.*)

During the period under review one of the chain of 5 x 5 latin squares designed to investigate the nitrogen requirements of second ratoons of D. 625 growing on pegassy clay was reaped. The results of this trial in Field No. 63 Melville, Pln. Cane Grove, are given in Table LX.

Rainfall, during the first month after harvest, was excessive, ample during the next two. Then followed five dry months, two of excessive precipitation and one when it was very dry. The cane was of poor quality.

TABLE LX.

Effect of Sulphate of Ammonia on Second Ratoons of D. 625 on Pegassy Clay at Pln. Cane Grove.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	25.03	12.51	3.131	81.7	21.54
2	19.50	13.02	2.539	83.7	16.54
4	17.04	14.08	2.399	84.8	16.01
6	17.45	12.85	2.242	81.4	19.09
8	14.74	13.27	1.956	84.0	15.46
Means	18.75	13.15	2.466	82.9	17.73
S.E. of means	1.08	0.27	0.142	—	—
Significant Differences (20 : 1)	3.33	0.83	0.438	—	—

'Z' value obtained for effect of nitrogen on tonnage .... =1.2820
" " " " " " " sucrose content .... =0.7745
" " required for P = 0.05 .... =0.5907
" " " " P = 0.01 .... =0.8443

Conclusions :—Under the conditions of the experiment :—

(a) Increasing doses of sulphate of ammonia have a depressing effect on the yield of cane and sucrose.

(b) Medium applications of sulphate of ammonia improve the sucrose content of the cane, but heavier dressings nullify this improvement.

(c) Dressings of sulphate of ammonia were without effect on the juice purity and the glucose ratio.

A statistical examination of the combined results of this experiment with those obtained in the three experiments reported in the previous bulletin (No. 5, pp. 68-72) indicates that the effects of treatment from square to square are so variable that no general recommendation can be made regarding the nitrogen requirements of D. 625 second ratoons growing on pegassy clay.

(A13) Sulphate of Ammonia on Pegassy Clay (Diamond 10, Second Ratoons).

Plant cane results reported in Sugar Bull. No. 4, p. 81, where the plant cane yields were erroneously ascribed to the variety D. 625.)

(First ratoon results reported in Sugar Bull. No. 5, pp. 83-84.)

Rainfall was excessive during the first five months of growth after the previous reaping, satisfactory during the next four, again excessive during the tenth and eleventh months, but unusually dry during the month before harvest. The cane was of good quality.

The results of the second ratoon trial are presented in Table LXI and shown graphically in Figure XIX where the plant cane and first ratoon results are included for comparison.

TABLE LXI.

Effect of Sulphate of Ammonia on Second Ratoons of Diamond 10 on Pegassy Clay at Pln. Wales.

S/A., Cwt./acres.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose, Ratio.
0	28.71	14.37	4.143	89.1	5.20
2	32.75	14.56	4.732	90.0	5.30
4	33.92	14.43	4.895	88.7	5.43
6	34.93	14.58	5.040	90.5	5.26
8	34.46	14.23	4.973	89.0	5.34
Means	32.96	14.43	4.756	89.4	5.30
S. E. of Means	1.02	—	0.147	0.3	—
Significant Differences (20 : 1)	3.14	—	0.453	1.0	—

'Z' value obtained for effect of nitrogen on tonnage .... =0.9014
" " " " " " " juice purity .... =0.8597
" " required for P=0.01 .... =0.8443

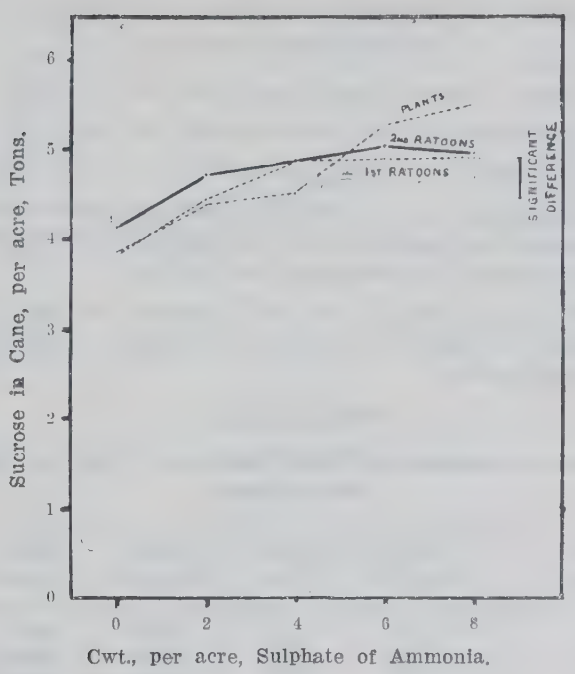


FIG. XIX.

Effect of Sulphate of Ammonia on Pegassy Clay (Diamond 10: Plants, First and Second Ratoons).

Conclusions:—Under the conditions of the experiment:—

(a) Dressings of sulphate of ammonia have had an effect on the yield of cane, the yield of sucrose and on the juice purity. They are without definite effect upon the sucrose content of the cane and the glucose ratio.

(b) A dressing of sulphate of ammonia at the rate of 2 cwt. per acre gives a definite increase in yield of cane and sucrose over the control plots. Heavier dressings are without definite effect.

(c) The effect of sulphate of ammonia applications on juice purity is somewhat variable.

(A14) Effect of Sulphate of Ammonia on Pegassy Clay (D. 625 Third Ratoons).

(Plant cane results reported in Sugar Bull. No. 3, pp. 97-98.)

(First ratoon results reported in Sugar Bull. No. 4, pp. 85-86.)

(Second ratoon results reported in Sugar Bull. No. 5, pp. 69-70.)

Rainfall was deficient at the sixth and twelfth months, but ample and frequently excessive during the rest of the period of growth, the total excess amounting to 13.54 ins. The cane was of fair quality.

The results of the third ratoon crop are presented in Table LXII and are shown graphically in Figure XX where the results of previous crops are included for comparison.

Table LXII.

Effect of Sulphate of Ammonia on Third Ratoons of D. 625 on Pegassy Clay at Pln. Lusignan.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice, Purity.	Glucose, Ratio.
0	13.91	13.46	1.858	86.5	8.72
2	17.96	13.70	2.399	85.9	8.99
4	17.87	13.40	2.387	85.0	9.82
6	20.52	13.17	2.741	84.1	11.57
8	23.58	13.09	3.150	83.7	11.39
Means	18.77	13.36	2.508	85.1	10.10
S.E. of means	1.40	—	0.187	0.6	—
Significant Differences (20 : 1)	4.31	—	0.576	1.9	—

'Z' value obtained for effect of nitrogen on tonnage..... = 0.9417

" " " " " " " " juice purity..... = 0.6114

" " required for P = 0.05..... = 0.5907

" " " " P = 0.01..... = 0.8443

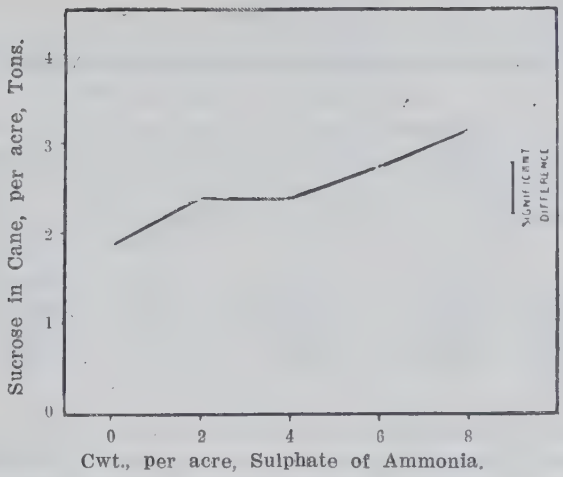


FIG. XX.

Effect of Sulphate of Ammonia on Pegassy clay (D. 625: Third Ratoons).

Conclusions:—Under the conditions of the experiment:—

(a) Increasing dressings of sulphate of ammonia give increasing yields of cane and sucrose.

(b) Increasing dressings of sulphate of ammonia have no definite effect on the sucrose content of the cane.

(c) Increasing dressings of sulphate of ammonia have a progressively deleterious effect on the juice purity.

(d) Increasing applications of sulphate of ammonia have no definite effect on the glucose ratio. There are, however, indications that such dressings impair the quality of the cane.

SUB-SECTION B. EXPERIMENTS WITH LIMING MATERIALS.

(B1-B4) EFFECT OF LIMING MATERIALS ON FLOOD-FALLOWED FRONTLAND (FIRST RATOONS).

(*Plant cane results reported in Sugar Bull. No. 5, pp. 88-90.*)

The individual results of the four 5 x 5 latin squares are shown in Table LXIII.

TABLE LXIII.

Effect of Liming Materials on First Ratoons on Flood-Fallowed Frontland.

Applications, per acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
	Pln. Blairmont, Field 71 Bush Lot, D. 625.				
Nil	46.16	11.41	5.47	78.6	21.49
½ ton P. limestone	44.22	12.09	5.24	81.8	17.63
1 ton P. limestone	43.56	11.56	5.17	78.1	18.05
½ ton Slaked lime	46.15	12.24	5.47	81.4	17.98
1 ton Slaked lime	46.76	12.01	5.55	79.0	18.87
Means	45.37	11.86	5.37	79.6	18.80
	Pln. Albion, Field 31 Kilcoy, D. 625.				
Nil	38.92	12.59	4.86	82.0	15.29
½ ton P. limestone	37.41	12.58	4.68	81.1	15.91
1 ton P. limestone	37.06	12.35	4.63	80.9	15.52
½ ton Slaked lime	32.35	12.23	4.04	82.6	16.09
1 ton Slaked lime	39.44	12.74	4.93	81.9	15.82
Means	37.03	12.50	4.63	81.3	15.73
	Pln. Enmore, Field 16 East, Paradise, Diamond 10.				
Nil	36.18	14.90	5.40	86.1	11.03
½ ton P. limestone	36.65	15.06	5.47	86.5	9.30
1 ton P. limestone	40.01	14.78	5.97	86.2	11.71
½ ton Slaked lime	37.88	15.24	5.66	85.6	10.41
1 ton Slaked lime	39.21	14.66	5.85	85.6	9.87
Means	37.98	14.93	5.67	86.0	10.46
	Pln. Ogle, Field 45 Ogle, P.O.J. 2878.				
Nil	31.78	13.79	4.36	84.8	8.13
½ ton P. limestone	32.24	13.95	4.42	83.5	8.67
1 ton P. limestone	34.10	14.06	4.68	84.2	9.28
½ ton Slaked lime	33.74	13.34	4.63	82.9	10.15
1 ton Slaked lime	32.43	13.46	4.45	82.9	9.99
Means	32.86	13.72	4.51	83.7	9.25

At Pln. Blairmont, rainfall was satisfactory during the first month after reaping, but deficient for the next four. The sixth to eighth months were abnormally wet, but after that precipitation was ample except during the last month before harvest. The quality of the cane was poor.

At Pln. Albion, after one favourable month following the previous harvest, this field encountered four months of subnormal rainfall. Then precipitation was excessive for three months but was again nearly normal for the next two. It was, however, very dry during the last two months of the growth period. The quality of the cane was poor.

At Pln. Enmore, there was a total deficiency of 6.72 inches of rainfall during the growth of this field, rains being deficient more particularly from the second to the fourth and during the last month. There were excessive in March and April 1936 when the canes were five to six months old. The quality of the cane was fair.

At Pln. Ogle, the rainfall immediately after the previous harvest was normal, but tended to be deficient from the second to the fifth month of growth. The sixth and seventh months were much wetter than usual, and the eleventh much drier. The cane was of good quality.

The combined results of the four trials are presented in Table LXIV.

TABLE LXIV.

Effect of Liming Materials on First Ratoons of Flood-Fallowed Frontland (Combination of Four Experiments).

Applications per acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice, Purity.	Glucose, Ratio.
Nil	38.26	13.17	5.040	82.9	13.99
½ ton P. Limestone	37.63	13.42	5.050	83.1	12.88
1 ton P. Limestone	38.68	13.19	5.102	82.3	13.64
½ ton Slaked Lime	37.53	13.26	4.976	82.6	13.66
1 ton Slaked Lime	39.46	13.22	5.218	82.4	13.64

A statistical examination of the results of the plant cane and first ratoon crops of all experiments indicates that the applications of liming materials have had no measurable effect in two crops.

Conclusions :—Under the conditions of the experiments :—

(a) Dressings of liming materials applied at planting at rates varying from half a ton to one ton per acre have had no definite residual effect on the yield of cane, the sucrose content of the cane, the juice purity or the glucose ratio.

(b) A consideration of the combined results of the plant cane and first ratoon crops of all experiments indicates that the dressings had no definite effect in two crops.

SUB-SECTION C. EXPERIMENTS WITH PHOSPHATIC MANURES.

(C1-C2) Superphosphate of Lime on Flood-Fallowed Frontland (Plant Canes, P.O.J. 2878).

The objects of these two trials have already been described in sub-section A (A1-A2), where certain interactions of sulphate of ammonia and superphosphate were recorded. This sub-section deals with the direct effects of superphosphate.

(C1) Field No. 81 R.H., Rose Hall.

The dressings of superphosphate in this trial were without direct effect on the yield of cane, the sucrose content of the cane, the juice purity or the glucose ratio.

(C2) Field No. 26 Rp., Blairmont.

The dressings of superphosphate in this trial were without direct effect on the yield of cane, the sucrose content of the cane or the juice purity.

The effect of applications of superphosphate on the glucose ratio is shown in Table LXV.

Table LXV.

Effect of Superphosphate of Lime on Plant Canes of P.O.J. 2878 on Flood-Fallowed Frontland.

Superphosphate, Cwt./acre.	Glucose Ratio.
0	7.65
3	8.77
6	7.75
Mean	8.06
S.E. of mean	0.33
Significant Difference (20 : 1)	1.00

'Z' value obtained for effect of superphosphate on glucose ratio = 0.9612
" " required for P = 0.05 .... = 0.7568

Conclusions :—Under the conditions of the experiment :—

(a) A medium dressing of superphosphate adversely affected the glucose ratio.

(b) A heavy dressing of superphosphate had no effect on the glucose ratio.

C3-C4) Superphosphate of Lime on Flood-fallowed Frontland (Second Ratoons, D. 625).

(*Plant cane results reported in Sugar Bull. No. 4, pp. 92-93.*)

(*First ratoon results reported in Sugar Bull. No. 5, pp. 91-93.*)

These two trials were designed to investigate the immediate and residual effects of graded dressings of superphosphate on the yield of variety D. 625 growing on flood-fallowed frontland.

The rainfall at Pln. Port Mourant was too heavy for the first four months following harvest, but tended to be low for the next five. The tenth month was unusually wet, but the last three months of growth were again dry. The cane was of fair quality.

At Pln. Rose Hall four months of excessive precipitation followed the previous harvest. These were, in turn followed by two months when it was satisfactory and three when it was rather dry. Two months before harvest rainfall was again excessive but it was nearly normal during the last month of growth. The cane was of good quality.

The individual results of the two trials are given in Table LXVI.

Table LXVI.

Immediate and Residual Effects of Superphosphate of Lime on Second Ratoons of D. 625 on Flood-Fallowed Frontland.

Superphosphate, Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
	Pln. Port Mourant, Field 13 Resource.				
Nil	42.33	15.03	6.265	85.0	12.32
3 cwt. plants only	44.15	15.36	6.534	86.3	10.97
6 cwt. „ „	42.05	14.73	6.223	85.4	13.17
2 cwt. plants and ratoons	43.38	13.73	6.420	83.3	13.86
4 cwt. „ „	47.27	15.17	6.996	84.1	14.27
Means	43.84	14.80	6.488	84.8	12.92
	Pln. Rose Hall, Field 20 Tappinsburg.				
Nil	35.67	13.59	4.972	87.3	8.01
3 cwt. plants only	35.33	14.25	4.925	86.4	9.49
6 cwt. „ „	36.26	14.23	5.055	87.3	9.30
2 cwt. plants and ratoons	36.15	14.02	5.039	88.0	9.27
4 cwt. „ „	36.03	13.62	5.023	85.2	11.20
Means	35.89	13.94	5.003	86.8	9.45

The combined results of the plant canes, first and second ratoons of the two trials are shown in Table LXVII.

TABLE LXVII.

Immediate and Residual Effects of Superphosphate of Lime on Second Ratoons of D. 625 on Flood-Fallowed Frontland (Combination of three crops of two Experiments).

Superphosphate, Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
Nil	40.07	13.87	5.559	85.4	9.63
3 cwt. plants only	40.33	13.91	5.609	85.5	9.60
6 cwt. „ „	40.11	14.01	5.618	85.7	9.75
2 cwt. plants and ratoons	40.81	13.63	5.563	84.6	10.29
4 cwt. „ „	40.83	13.92	5.685	85.1	10.45
Means	40.43	13.87	5.607	85.3	9.94

'Z' value obtained for effect of superphosphate on tonnage..... = negative
„ „ „ „ „ „ „ „ sucrose content..... = negative
„ „ „ „ „ „ „ „ juice purity..... = 0.0622
„ „ „ „ „ „ „ „ glucose ratio..... = 0.1171
„ „ required for P = 0.05..... = 0.4632

Conclusions:—Under the conditions of the experiments :—

(a) Graded dressings of superphosphate of lime applied to plants only and to plants and ratoons had no definite immediate or residual effects on the yield of cane, the sucrose content, the juice purity or the glucose ratio.

(C 5) BASIC SLAG ON PEGASSY CLAY (PLANT CANES, P.O.J. 2878).

The objects of this trial were described in sub-section A (A 11).

Dressings of basic slag were in this trial, without direct effect on the yield of cane, the sucrose content of the cane, the juice purity and the glucose ratio.

(C 6) Superphosphate of Lime on Pegassy Clay

(Second Ratoons, P.O.J. 2878).

(Plant cane results reported in Sugar Bull. No. 4, pp. 92-93.)

(First ratoon results reported in Sugar Bull. No. 5, pp. 91-93.)

Rainfall, during the first month of growth, was excessive, during the next two, ample. Then followed five dry months, two unusually wet, and two very dry. The cane was of good quality.

The results of the second ratoon crop are presented in Table LXVIII.

Table LXVIII.

Immediate and Residual Effects of Superphosphate of Lime on Second Ratoons of P.O.J. 2878 on Pegassy Clay at Pln. Cane Grove.

Superphosphate, Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
Nil	16.94	15.29	2.590	88.4	7.38
3 cwt. plants only	18.41	16.22	2.986	90.6	4.80
6 cwt. plants only	21.64	16.26	3.519	90.6	5.58
2 cwt. plants and ratoons	24.00	15.64	3.754	89.4	5.71
4 cwt. „ „	23.21	15.88	3.686	89.4	6.24
Means	20.84	15.86	3.305	89.7	5.94
S.E. of means	0.73	0.22	0.116	—	0.37
Significant Differences (20 : 1)	2.25	0.68	0.357	—	1.15

'Z' value obtained for effect of superphosphate on tonnage = 1.4269
„ „ „ „ „ „ „ „ sucrose content = 0.6166
„ „ „ „ „ „ „ „ glucose ratio = 0.9422
„ „ required for P = 0.05 = 0.5907
„ „ „ „ P = 0.01 = 0.8443

The combined results of the three crops are presented in Table LXIX.

TABLE LXIX.

Immediate and Residual Effects of Superphosphate of Lime on Second Ratoons of P.O.J. 2878 on Pegassy Clay at Pln. Cane Grove. (Totals and Means of Three Crops).

Superphosphate, Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice, Purity.	Glucose, Ratio.
Nil	60.44	15.00	9.120	88.7	7.54
3 cwt. plants only	74.14	14.95	11.187	88.9	6.75
6 cwt. plants only	77.15	15.23	11.642	89.8	6.11
2 cwt. plants and ratoons	77.72	15.19	11.728	89.2	6.24
4 cwt. plants and ratoons	81.52	15.10	12.301	89.2	6.26
Means	74.19	15.09	11.195	89.2	6.58
S.E. of means	0.64	—	0.096	—	0.27
Significant Differences (20 : 1)	1.85	—	0.279	—	0.78

'Z' value obtained for effect of superphosphate on tonnage = 1.4505
" " " " " " " " glucose ratio = 0.7933
" " required for P = 0.01 ..... = 0.6954

Conclusions:—Under the conditions of the experiment:—

(a) Applications of superphosphate have a marked effect on the tonnage and the glucose ratio. They are without definite effect on the sucrose content of the cane and the juice purity.

(b) Applications at the rate of 4 cwt. per acre to plants and ratoons give the best yield. Lower increments are given by applications of 6 cwt. per acre whether given all at one time with the plants or split up in three separate dressings to plants, first and second ratoons. Still lower increments are obtained by an application at the rate of 3 cwt. per acre at planting.

(c) The heavier applications of superphosphate have a beneficial effect on the glucose ratio.

SUB-SECTION D. TRIALS WITH POTASSIC MANURES.

The trials discussed in this sub-section are complex fertiliser experiments. The effects of applications of sulphate of ammonia and of phosphatic manures together with any interactions with potash have been considered in sub-section A and C. The results here reported concern the direct effects of applications of sulphate of potash.

(D1—D2) Sulphate of Potash On Flood-Fallowed Frontland (Plant Canes, P.O.J. 2878).

The results of the trials at Pln. Rose Hall indicated that applications of sulphate of potash to plant canes of P.O.J. 2878 growing on flood-fallowed frontland were without direct effect on the yield of cane, the sucrose content of the cane, the juice purity and the glucose ratio.

In the trial at Blairmont applications of sulphate of potash were without direct effect on the yield of cane, the sucrose content of the cane, and the juice purity. A definite, but unusual effect on the glucose ratio was noted. Medium applications of sulphate of potash increased the glucose ratio while heavy dressings diminished it.

(D3) Effect of Sulphate of Potash on Pegassy Clay (Plant Canes, P.O.J. 2878).

The results obtained in Field No. 31 East, Pln. Uitvlugt, are given in Table LXX and are presented graphically in Figure XXI.

Table LXX.

Effect of Sulphate of Potash on Pegassy Clay.

Sulphate of Potash Cwt./acre.	Cane, Tons/acre.	Sucrose, Tons/acre.
0	19.56	2.864
2	25.90	3.792
4	25.26	3.698
Means	23.57	3.452
S.E. of means	1.61	0.236
Significant Differences (20 : 1)	4.63	0.678

'Z' value obtained for effect of potash on tonnage ... =0.9143

„ „ required for P=0.05 ... =0.7568

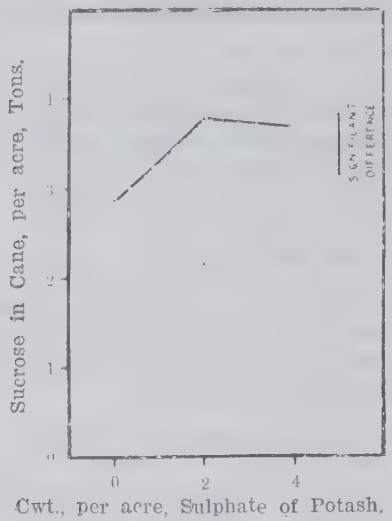


FIG. XXI.

Effect of Sulphate of Potash on Pegassy Clay (P.O.J. 2878: Plant Canes).

Conclusions:—Under the conditions of the experiment:—

(a) Applications of sulphate of potash have a definite effect on the yield of cane and sucrose.

(b) No definite effect is noted as regards the sucrose content of the cane, the juice purity or the glucose ratio.

(c) Increasing the dose of potash from 2 cwt. per acre to 4 cwt. per acre gives no further increase in yield of cane or sucrose.

SUB-SECTION E.—DISCUSSION AND SUMMARY.

NITROGENOUS FERTILISERS.

The experiments reported in this and in previous bulletins have given greater definition to the nitrogen requirements of the principal cane varieties of the Colony. The results have generally indicated the propriety of increasing applications of sulphate of ammonia. That the industry has followed these indications is shown by the amounts of sulphate of ammonia recently imported into the Colony. In 1935 the quantity imported was 10,268 tons. In 1936 the quantity imported was 10,010 tons. These amounts are greatly in excess of previous importations.

The experiments so far executed do no more than sketch the outlines of the problem. It is essential that the recommendations made should form the basis of large-scale field tests by the managers themselves.

The nitrogen requirements of cane in British Guiana still present many problems requiring field experiment. The interaction of irrigation and nitrogen applications requires study. Trials with non-acidifying nitrogenous manures are necessary. The requirements of the newer varieties need further definition.

D. 625 on Flood-Fallowed Frontland.

Plant canes of D. 625 growing on flood-fallowed *frontland* require applications of 2-3 cwt. per acre of sulphate of ammonia. *First, second, and third ratoons of D. 625* growing on flood-fallowed *frontland* require applications at the rate of 4 cwt. per acre.

D. 625 on Pegassy Clay.

Experiments indicate that *plant canes and first ratoons of D. 625* growing on *pegassy clay* should receive applications of sulphate of ammonia at the rate of 6 cwt. per acre. On the other hand it does not seem advisable to apply such heavy doses to these highly acidic soils unless accompanied by adequate dressings of ground limestone. Trials are being made with certain non-acidifying nitrogenous manures and definite recommendations should await their completion.

Experiments with *second ratoons of D. 625* growing on *pegassy clay* have given such variable results that no definite recommendations can be made on this point.

P.O.J. 2878 on Flood-Fallowed Frontland.

Two further experiments reaped during the period under review have confirmed previous findings that *plant canes of P.O.J. 2878* growing on flood-fallowed *frontland* should be given 2 cwt. per acre of sulphate of ammonia.

The combined results of twelve 4 x 4 latin squares indicate that *first ratoons of P.O.J. 2878* growing on flood-fallowed *frontland* should be given 4 cwt. per acre of sulphate of ammonia. The application of a further 2 cwt. per acre results in a further small profit but it is doubtful whether, under general circumstances, the further outlay on sulphate of ammonia is justified in view of the small extra profit.

Experiments indicate that *second ratoons of P.O.J. 2878* growing on flood-fallowed *frontland* should receive 4 cwt. per acre of sulphate of ammonia.

P.O.J. 2878 on Pegassy Clay.

Very few trials with *P.O.J. 2878* on *pegassy clay* have been completed. There are indications that heavy dressings of nitrogenous manures are required but no recommendations can be made at present having regard to the highly acidic nature of these soils.

Diamond 10 on Flood-Fallowed Frontland.

No experiments with *plant canes of Diamond 10* on flood-fallowed *frontland* have yet been completed.

As reported in the previous bulletin only one experiment with *first ratoons of Diamond 10* on flood-fallowed *frontland* has been undertaken. The results indicate that an application at the rate of 2 cwt. per acre is desirable but, in view of the responses obtained with ratoon crops of other varieties it would appear that the matter requires further investigation.

One experiment with *second ratoons of Diamond 10* on flood-fallowed *frontland* indicates that dressings of 4 cwt. per acre should be applied.

Diamond 10 on Pegassy Clay.

One experiment with *plant canes of Diamond 10* on *pegassy clay* gives results indicating that applications at the rate of 6 cwt. per acre are required.

The results of one experiment with first ratoons of Diamond 10 on *pegassy clay* show that applications at the rate of 2 cwt. per acre give definite increases. These are indications that applications at the rate of 4 cwt. per acre are more profitable. In view of the results obtained with other varieties on *pegassy clays* this question requires further investigation.

One experiment with *second ratoons of Diamond 10* on *pegassy clay* indicates that dressings at the rate of 2 cwt. per acre are required.

It will be seen that the nitrogen requirements of plant canes and ratoons of D. 625 and P.O.J. 2878 growing on flood-fallowed frontland have been fairly well defined by the experiments so far completed. The requirements of Diamond 10 on flood-fallowed frontland require further investigation.

The problem of the nitrogenous fertilisation of pegasse soils is by no means settled. These soils are highly acidic and many of them approach the point where acidity becomes the controlling factor affecting cane growth. Dressings of sulphate of ammonia increase soil acidity. The heavy dressings of sulphate of ammonia, which the experiments indicate are necessary on pegassy soils, should on no account be applied unless accompanied by adequate applications of liming materials.

Experiments on pegassy soils with non-acidifying nitrogenous manures have been established and the results will be reported in later bulletins.

The problem of the interaction of dressings of sulphate of ammonia with different intensities of irrigation has formed the basis of design of a number of experiments in progress. The results will shortly be available.

Liming Materials.

During the last seven years a number of trials with liming materials have been executed. All the soils of the experimental areas were definitely acidic yet no definite increase have been obtained on flood-fallowed frontlands and only slight improvements have been noted on pegassy soils which are highly unsaturated.

Further soil samples have been collected from each plot of a number of latin squares receiving graded dressings of sulphate of ammonia and have been examined as regards their reaction and theoretical lime requirements. The results continue to demonstrate statistically significant increases in acidity due to applications of sulphate of ammonia.

In view of this tendency towards increased acidity it is advisable to apply small dressings of liming materials at planting. Such applications should be considered as a form of insurance rather than as a manurial application which will sensibly increase the yield of cane.

As in the plant canes, the first ratoon results of the present experiments give slight indications that small dressings of liming materials have a beneficial effect on yields but such increases might well have occurred by pure chance.

The flood-fallowing experiments, considered in a later section, indicate that ground limestone applied before flooding is more effective than similar applications made just before planting. It is therefore desirable to initiate a series of liming trials where the liming materials are applied before flooding.

In other countries acid soils supporting sugar-cane usually give marked responses to applications of liming materials. In many cases the responses are considered to be due to the improvement in soil texture which results from applications of lime. In this Colony where flood-fallowing is generally practiced and has such a marked beneficial result on soil texture it is not surprising that applications of liming materials are less effective.

Phosphatic Manures.

A number of experiments with varied kinds of phosphatic manures have been executed on both flood-fallowed frontland and pegassy clay soils. On the flood-fallowed frontland soils it has never been possible to obtain definite increases in yield of cane, in spite of the fact that the soils of the majority of the areas were deficient in available phosphate, as judged by chemical tests.

At the most it has been possible only to demonstrate on these soils an improvement in the quality of the cane. In the present bulletin it has been demonstrated in two separate experiments that applications of phosphates have, in connection with dressings of sulphate of ammonia, a definite effect upon the quality of the cane. In the presence of small applications of sulphate of

ammonia applications of superphosphate improve the quality. In the presence of larger dressings of sulphate of ammonia applications of superphosphate impair the quality of the cane.

On the pegassy clay soils, shown by chemical tests to be deficient in supplies of available phosphate a marked response is obtained not only as regards the yield of cane, but also as regards its quality.

Results reported in previous bulletins have indicated that Nicifos, Type B, is preferable as a source of phosphate to superphosphate, basic slag or Preciphos. The trial reported in the present bulletin concerns the immediate and residual effects of superphosphate applied at varying rates to pegassy clay. A consideration of results of three crops indicates that under these circumstances it is desirable to apply superphosphate at the rate of 4 cwt. per acre to plant canes, first ratoons and recond ratoons. This recommendation takes the place of that given in the previous bulletin, where the results of only two crops were available.

Information of considerable value has emerged from the trials so far conducted but it is obvious that the question of phosphatic manuring still requires further investigation.

It seems that the Truog method of assessing the phosphate status of soils is valuable as far as pegassy clays are concerned. Its value in regard to flood-fallowed frontland soils is, at present, doubtful. It is possible that these soils which show chemical deficiency in available phosphates but yet fail to respond to applications of phosphatic manures have sufficient amounts of silica available to enhance the uptake and efficiency of the small amounts of chemically available phosphate. Such a circumstance would explain the lack of response to phosphates in such areas.

Potassic Manures.

The two trials with potassic manures on flood-fallowed frontland have indicated that no yield responses are to be expected in the plant canes. In one case an interaction of sulphate of ammonia and sulphate of potash is apparent. In contradistinction to the effects of superphosphate applications of sulphate of potash with small dressings of sulphate of ammonia impair the quality of the cane. With larger dressings of sulphate of ammonia applications of sulphate of potash improve the quality. It is probable that more marked differences will be noted in the ratoon crops.

The one experiment on pegassy clay has produced interesting results. A dressing at the rate of 2 cwt. per acre of sulphate of potash has been responsible for a marked and profitable increase in yield, an application at the rate of 4 cwt. per acre gave no further response. A similar experiment (*Sugar Bull.* No. 3, pp. 116-117) indicated that yield increases might be expected from applications of potassic manures to pegassy clays. The matter is worthy of further experimentation.

SUMMARY.

In this brief summary the recommendations which are made with confidence are printed in HEAVY TYPE while those of a tentative nature appear in ordinary type.

Nitrogen Fertilisers.

(Flood-Fallowed Frontland).

D. 625.

Plant canes should receive 2-3 cwt. per acre of sulphate of ammonia.

FIRST, SECOND AND THIRD RATOONS SHOULD RECEIVE 4 CWT. PER ACRE OF SULPHATE OF AMMONIA.

P.O.J. 2878.

PLANT CANES SHOULD RECEIVE 2 CWT. PER ACRE OF SULPHATE OF AMMONIA. FIRST AND SECOND RATOONS SHOULD RECEIVE 1 CWT. PER ACRE.

Diamond 10.

Plant canes probably require 2 cwt. per acre of sulphate of ammonia. One experiment indicates that first ratoons require 2 cwt. per acre of sulphate of ammonia. Further investigation is necessary.

SECOND RATOONS REQUIRE 4 CWT. PER ACRE OF SULPHATE OF AMMONIA.

Pegassy Clay.

D. 625.

PLANT CANES AND FIRST RATOONS SHOULD RECEIVE 6 CWT. PER ACRE OF SULPHATE OF AMMONIA. IT IS ESSENTIAL THAT SUCH APPLICATIONS SHOULD BE ACCOMPANIED BY DRESSINGS OF GROUND LIMESTONE AT THE RATE OF 1 TON PER ACRE.

No definite recommendations can be made regarding the requirements of second ratoons.

P.O.J. 2878.

Plant canes probably require 6 cwt. per acre of sulphate of ammonia. Such dressings should be accompanied by applications of ground limestone at the rate of 1 ton per acre. No recommendations can be made regarding the nitrogen requirements of ratoons of this variety.

Diamond 10.

It is probable that plant canes require applications at the rate of 6 cwt. per acre of sulphate of ammonia. Such applications should be accompanied by adequate dressings of ground limestone.

First and second ratoons appear to require applications at the rate of 2 cwt. per acre. This point requires further investigation.

Liming Materials.

BOTH FRONTLANDS AND PEGASSY CLAYS SHOULD RECEIVE 1 TON OF LIMESTONE AT PLANTING. THE APPLICATION MAY BE REDUCED IF BASIC SLAG IS ALSO APPLIED.

Phosphatic Manures.

On flood-fallowed frontland applications of phosphates give little or no yield increase, even on soils chemically deficient in available phosphate. The problem of the phosphatic manuring of these soils requires further study.

On pegassy soils shown by chemical methods to be deficient in supplies of available phosphate, applications of phosphatic manures at the rate of 4 cwt. per acre should be given to plant canes, first and second ratoons. On this soil type the advantages of applying Nicifos should be considered.

Potassic Manures.

On frontland clay soils potassic manures do not appear to give yield increases. On pegassy clay soils applications at the rate of 2 cwt. per acre appear to be highly profitable.

FLOOD-FALLOWING TRIALS.

A general description of the objects and a record of the plant cane and first ratoon yields of two experiments concerned with flood-fallowing were given in *Sugar Bulletins* No. 4. pp. 96-104 and No. 5. pp. 101-107. The present discussion deals with the results obtained at Pln. Port Mourant. The trials originally established at Pln. Lusignan were severely damaged by floods. These trials were subsequently re-established but the plant cane yields from the one which has been reaped are so poor that no useful purpose is served by considering the results.

Flood-Fallowing Experiment in Field No. 28 Tain Windward, Pln. Port Mourant.

The treatments were as follows :—

(a) Flooded to a minimum depth of 12 inches for six months ;

(b) Similar to (a) but with five tons molasses per acre added to flood water ;

(c) Similar to (a) but sown with floating vegetation ;

(d) Partially flooded (depth of 3 in.) for six months and semi-aquatic weeds allowed to grow spontaneously.

The rainfall was better than usual immediately after the previous harvest, but the next four months were unusually dry. These were followed by six months of ample rains but the last month before harvest was even drier than it normally is. The cane was of fair quality.

The results of the second ratoon crop are presented in Table LXXI together with the combined results for the three crops.

Table LXXI.

Residual and Total Effects of Various Types of Flood-Fallow.

Treatment.	Cane, Tons/acre.	Sucrose, % Cane.	Juice Purity.	Glucose Ratio.	Sucrose, Tons/acre.	Sucrose, Tons/acre. Three crops.
(a)	39.00	14.34	83.4	11.27	5.487	14.128
(b)	37.30	13.86	82.2	13.30	5.248	15.436
(c)	38.89	13.76	82.7	13.21	5.471	14.882
(d)	35.06	14.31	84.8	10.44	4.933	13.652
Means	37.56	14.07	83.3	12.06	5.286	14.526

Z value obtained for effect of treatments on tonnage..... ..... = 0.2976
„ „ „ „ „ „ „ sucrose content..... = 0.0676
„ „ „ „ „ „ „ juice purity..... = 0.6892
„ „ „ „ „ „ „ glucose ratio..... = 0.2955
„ required for P = 0.05 ..... = 0.7798

Conclusion:—Under the conditions of the experiment :—

Treatments had no definite effect in the second ratoon crop on the yield of cane, the sucrose content, the juice purity or on the glucose ratio

The results obtained for the three crops are graphically presented in Figure XXII and are discussed in later paragraphs.

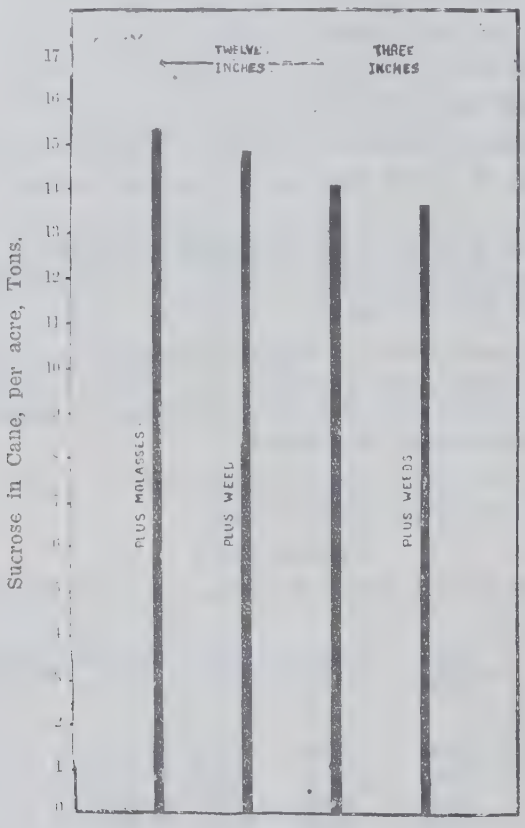


FIG. XXII.

Effect of Various Types of Flood-Fallow (D 625: Plant Canes, First and Second Ratoons).

Flood-Fallowing Experiment in Field No. 28 Tain Leeward, Pln. Port Mourant.

Treatments :—

(a) Grass-fallowed for 12 months ;

(b) Grass-fallowed for 8 months, flood-fallowed for 4 months ;

(c) Grass-fallowed for 6 months, flood-fallowed for 6 months ;

(d) Not grass-fallowed, flood-fallowed for 12 months.

Half plot treatments included the application of the ground limestone before flooding and after flooding.

The second ratoons were reaped on March 11th, 1937.

The rainfall throughout the crop was slightly above the normal and was well distributed. The young spring experienced a month of dry weather but rainfall was adequate during the major growth period. Very dry weather was experienced during the last four months of the crop. The cane was of good quality.

The treatment had no definite effect on the sucrose content of the cane, the glucose ratio or the juice purity. The average values for these analytical figures are :—

Percentage of sucrose in cane	15.84
Juice Purity	86.6
Glucose ratio	9.91

The yields of sucrose per acre for the second ratoon crop and the totals for the three crops are given in Table LXXII and presented graphically in Figure XXIII.

Table LXXII.

Effects of Duration of Flooding and Time of Application of Limestone on Yield of Sucrose, Tons per Acre.

1 Ton Ground Limestone per Acre.

Duration of Flooding.	Before Flooding.		After Flooding.		Means.	
	2nd Ratoons.	Total, 3 Crops.	2nd Ratoons.	Total, 3 Crops.	2nd Ratoons.	Total, 3 Crops.
No flooding	4.037	12.084	4.513	14.138	4.277	13.113
4 months	5.714	16.540	5.013	15.517	5.364	16.029
6 months	5.571	17.900	5.065	16.741	5.317	17.319
12 months	5.711	18.409	6.103	18.338	5.904	18.370
Totals	21.033	64.933	20.694	64.734	20.862	64.831
Means	5.258	16.233	5.174	16.184	5.216	16.208

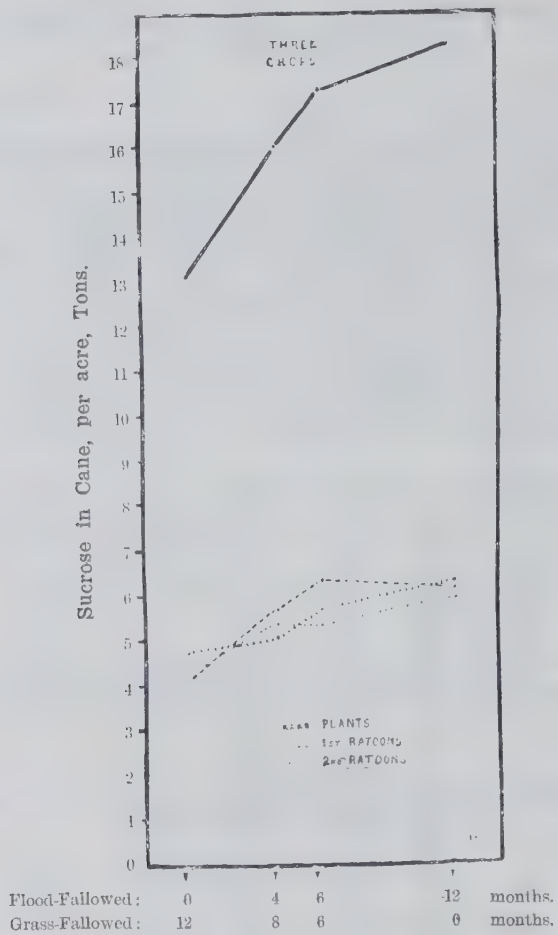


FIG. XXIII.

Effect of Duration of Flood-Fallow.

Table LXXIII presents the second ratoon yields for the major issues involved in the trial.

TABLE LXXIII.

Effect of Limestone before or after Flooding in the presence and absence of Flood-Fallowing on the Yield of Sucrose, Tons per Acre.

	No Flooding	Flooding
Limestone before	4.037	5.665
Limestone after	4.513	5.394
Means	4.277	5.528
Significant difference (20 : 1)		1.244

'Z' value obtained for effect of flooding on yield of cane ..... = 0.9010
„ „ required for P = 0.05..... = 0.8463

Table LXXIV presents a similar arrangement of the combined results of the three crops.

TABLE LXXIV.

Effects of Limestone before and after Flooding, in presence and absence of Flooding, on the yield of Sucrose, Tons per Acre, (Totals of Three Crops).

	No Flooding	Flooding
Limestone before	12.084	17.616
Limestone after	14.138	16.865
Means	13.113	17.273

Conclusions :—Under the conditions of the experiment :—

(a) Flood-fallowing does not effect the sucrose content, the juice purity or the glucose ratio of the second ratoon crop.

(b) The time of application of limestone (before flood or grass-fallow, or just before planting) has no effect on the yield of cane, the sucrose content, the juice purity or the glucose ratio.

(c) Flood-fallowing has a definite effect on the yield of cane and sucrose in the second ratoons. The mean increase amounts to 1.251 tons of sucrose per acre.

Discussion.

Hardly any of the results obtained with the second ratoon crop of either of the trials are statistically significant. This is only to be expected having regard to the fact that the original design of the trials envisaged their replication on several estates.

The establishment of small plot trials investigating flood-fallowing is expensive and requires the erection of many subsidiary meres to bound the various plots. It is not perhaps surprising, therefore, that while it is the general consensus of opinion that further trials concerning flood-fallowing should be initiated, yet none has been definitely established.

It is hoped that the steadily increasing opinion favouring extension upon these lines will be effective in promoting further co-operative field work.

Flood-fallowing is one of the master factors affecting the fertility of our cane lands, yet actual field investigations have so far been confined to four experiments on two estates.

Judging from the results of three crops it would appear that bare flood-fallowing to a minimum depth of 12 inches gives nearly half a ton more sucrose per acre than a partial fallowing to a depth of 3 inches. The deeper flooding has only shown its superiority in the second ratoon crop. For the plant cane and first ratoon crops there was little to choose between the two treatments.

The addition of final molasses at the rate of five tons per acre to the flooding water gives a considerable increase in the plant cane and first ratoon crops. Its effect seems to have worn off since a slight depression in the second ratoon crop is noted. The increased yield, 1.308 tons of sucrose per acre, obtained during the three crops represents a fair profit and the results indicate a possible outlet for final molasses.

The collection of floating vegetation from the trenches and its introduction into flooded fields has had no effect on the second ratoon yields. Its beneficial effects have been almost entirely confined to the first ratoon crop. In three crops the procedure has been responsible for a yield increase of 0.754 tons of sucrose per acre and under these circumstances such green manuring would appear to be profitable.

The results of the second flooding trial stress the remarkable effects resulting from flood-fallowing the frontland clays of the coastal belt. The procedure has been, in three crops, responsible for an increased yield of 32 per cent. over a grass-fallow.

The experiment was not sufficiently precise to distinguish between the effects of flood-fallowing for four, six and twelve months. The twelve-month period was more effective than either the four or the six-month period in the second ratoon crop. It seems that the longer the period of flood-fallow the more prolonged are the beneficial effects.

The combined results indicated that flooding for six months gives an increased yield in three crops of 1.290 tons of sucrose per acre over the four-month period while the twelve month period gives an increased yield in three crops of 1.051 tons of sucrose per acre over the six-month period.

The combined results indicate that ground limestone should be applied before flooding.

Summary.

It has been emphasized that two experiments on a field operation of this nature are insufficient as a basis for any conclusive recommendations, and the execution of a larger number of trials is essential. Meanwhile the following suggestions are put forward :—

(i) that flooding to a minimum depth of twelve inches is preferable to a flooding at a minimum depth of three inches, the difference being noticeable only in the second ratoon crop.

(ii) that the application of final molasses at the rate of five tons per acre to the flooding water is a profitable undertaking.

(iii) that the collection of floating vegetation and its introduction to fields under flood-fallow is a profitable undertaking.

(iv) that flood-fallowing is responsible for a yield increase of the order of 32 per cent. over a grass-fallow.

(v) that the longer the period of flooding the more marked are the beneficial effects.

(vi) that dressings of ground limestone should be made prior to flooding.

APPENDIX I.—RAINFALL DATA.

Rainfall at Sophia Experiment Station.

Month.		Rainfall 1935-1937. Inches.	Average Rainfall 1921-1936. Inches.	Excess or Deficit During Growth of the Various Experiments.								
				Field 15 West.	Field 2 East.	Field 3 West.	Field 8 East, A, B.	Field 3 East, A, B.	Field 12 East.	Fields 9 East. A, B. C, & 5, 7, 8 & 9 West.	Field 10 East A, B.	Field 1 East. A,B,C,D.
May	1935	12.71	11.72	+ .99								
June		14.00	14.11	− 0.11	− 0.11							
July		8.94	10.63	− 1.69	− 1.69	− 1.69						
August		11.71	8.10	+ 3.61	+ 3.61	+ 3.61	+ 3.61					
September		5.30	2.70	+ 2.60	+ 2.60	+ 2.60	+ 2.60	+ 2.60				
October		4.22	3.95	+ 0.27	+ 0.27	+ 0.27	+ 0.27	+ 0.27	+ 0.27			
November		4.34	5.78	− 1.44	− 1.44	− 1.44	− 1.44	− 1.44	− 1.44			
December		4.36	14.67	−10.31	−10.31	−10.31	−10.31	−10.31	−10.31	−10.31		
January	1936	6.51	8.55	− 2.04	− 2.04	− 2.04	− 2.04	− 2.04	− 2.04	− 2.04		
February		2.38	3.87	− 1.49	− 1.49	− 1.49	− 1.49	− 1.49	− 1.49	− 1.49		
March		9.43	4.36	+ 5.07	+ 5.07	+ 5.07	+ 5.07	+ 5.07	+ 5.07	+ 5.07	+ 5.07	
April		14.40	5.25	+ 9.15	+ 9.15	+ 9.15	+ 9.15	+ 9.15	+ 9.15	+ 9.15	+ 9.15	
May		15.28	11.72	+ 3.56	+ 3.56	+ 3.56	+ 3.56	+ 3.56	+ 3.56	+ 3.56	+ 3.56	+ 3.56
June		13.92	14.11	− 0.19	− 0.19	− 0.19	− 0.19	− 0.19	− 0.19	− 0.19	− 0.19	− 0.19
July		11.91	10.63	+ 1.28	+ 1.28	+ 1.28	+ 1.28	+ 1.28	+ 1.28	+ 1.28	+ 1.28	+ 1.28
August		1.76	8.10	− 6.34	− 6.34	− 6.34	− 6.34	− 6.34	− 6.34	− 6.34	− 6.35	− 6.34
				+ 2.92	+ 1.93			+ .12				
September		1.05	2.70			− 1.65	− 1.65		− 1.65	− 1.65	− 1.65	− 1.65
						+ .39						
October		3.79	3.95				− 0.16		− 0.16	− 0.16	− 0.16	− 0.16
							+ 1.92		− 4.29			
November		4.04	5.78							− 1.74	− 1.74	− 1.74
										− 4.86		
December		23.04	14.67								+ 8.37	+ 8.37
January	1937	14.63	8.55								+ 6.08	+ 6.08
February		.75	3.87								− 3.12	− 3.12
March		1.53	4.36								− 2.83	− 2.83
											+17.48	+ 3.26

RAINFALL AT PLANTATION SKELDON.

Month.		Rainfall 1935—1936, Inches.	Average Rainfall 1906—1936, Inches.	Excess or Deficit during Growth of the Various Experiments. Fields 7 E.M., 8 E.M. & 8 Sp
October	1935	10.57	3.13	+ 7.44
November		.93	3.85	— 2.92
December		3.15	7.22	— 4.07
January	1936	2.55	6.79	— 4.24
February		1.07	4.64	— 3.57
March		17.21	5.70	+11.51
April		7.20	6.01	+ 1.19
May		11.76	9.99	+ 1.77
June		9.17	10.52	— 1.35
July		5.64	9.21	— 3.57
August		6.03	6.24	— .21
September		3.59	2.79	+ .80
				+ 2.78

RAINFALL AT PLANTATION PORT MOURANT.

Month.		Rainfall 1935—1937, Inches.	Average Rainfall 1880—1936, Inches.	Excess or Deficit during Growth of the Various Experiments. Field 28 T.W.	Field 11 T.L.	Fields 13 R. & 28 T.L.
October	1935	5.24	1.73	+ 3.51		
November		1.15	3.33	— 2.18	— 2.18	
December		2.51	7.75	— 5.24	— 5.24	
January	1936	2.93	6.63	— 3.70	— 3.70	
February		1.65	4.98	— 3.33	— 3.33	
March		14.30	5.07	+ 9.23	+ 9.23	+ 9.23
April		9.68	5.48	+ 4.20	+ 4.20	+ 4.20
May		10.98	8.99	+ 1.99	+ 1.99	+ 1.99
June		11.23	9.14	+ 2.09	+ 2.09	+ 2.09
July		5.72	7.84	— 2.12	— 2.12	— 2.12
August		4.32	5.19	— .87	— .87	— .87
September		.22	1.79	— 1.57	— 1.57	— 1.57
October		.83	1.73	+ 2.01	— .90	— .90
November		1.40	3.33		— 1.93	— 1.93
December		12.71	7.75		— 4.33	+ 4.96
January	1937	4.85	6.63			— 1.78
February		1.03	4.98			— 3.95
March		1.45	5.07			— 3.62
						+ 5.73

RAINFALL AT PLANTATION ALBION.

Month.		Rainfall 1935—1937, Inches.	Average Rainfall 1865—1936, Inches.	Excess or Deficit during Growth of the Various Experiments.	
				Field 31 K.	Field 49 A.
October	1935	4.47	1.81	+ 2.66	
November		1.58	3.61	− 2.03	
December		2.66	8.12	− 5.46	
January	1936	2.92	6.71	− 3.79	
February		1.38	4.97	− 3.59	
March		11.64	5.55	+ 6.09	+ 6.09
April		10.77	6.24	+ 4.53	+ 4.53
May		12.31	9.19	+ 3.12	+ 3.12
June		10.36	8.92	+ 1.44	+ 1.44
July		6.97	8.25	− 1.28	− 1.28
August		4.16	5.52	− 1.36	− 1.36
September		.06	1.99	− 1.93	− 1.93
October		1.35	1.81	− 1.60	− .46
November		2.49	3.61		− 1.12
December		12.08	8.12		+ 3.96
January	1937	5.28	6.71		− 1.43
February		1.01	4.97		− 3.96
March		1.98	5.55		− 3.57
					+ 4.03

RAINFALL AT PLANTATION ROSE HALL.

Month.		Rainfall 1936—1937, Inches.	Average Rainfall 1907—1936, Inches.	Excess or Deficit during Growth of the Various Experiments.	
				Field 81 R.H.	Fields 20 T. & 30 R.H.
February	1936	1.40	6.11	− 4.71	
March		12.51	6.02	+ 6.49	+ 6.49
April		12.90	5.74	+ 7.16	+ 7.16
May		12.42	10.71	+ 1.71	+ 1.71
June		10.92	10.78	+ .14	+ .14
July		6.77	10.07	− 3.30	− 3.30
August		4.70	6.11	− 1.41	− 1.41
September		1.51	2.20	− .69	− .69
October		.75	2.58	− 1.83	− 1.83
November		2.79	3.33	− .54	− .54
December		15.38	9.34	+ 6.04	+ 6.04
January	1937	6.19	8.01	− 1.82	− 1.82
				+ 7.24	+ 11.95

RAINFALL AT PLANTATION BLAIRMONT.

Month.		Rainfall 1935-1936, Inches.	Average Rainfall 1897-1936, Inches.	Excess or Deficit during Growth of the Various Experiments.			
				Field 71 B.L.	Field 4 H.	Field 26 Rp.	Field 24 Rp.
October	1935	5.97	2.45	+ 3.52			
November		1.16	3.40	− 2.24	− 2.24		
December		4.11	9.58	− 5.47	− 5.47	− 5.47	
January	1936	4.62	7.73	− 3.11	− 3.11	− 3.11	− 3.11
February		1.98	4.99	− 3.01	− 3.01	− 3.01	− 3.01
March		13.22	6.42	+ 6.80	+ 6.80	+ 6.80	+ 6.80
April		15.88	6.87	+ 9.01	+ 9.01	+ 9.01	+ 9.01
May		14.91	11.40	+ 3.51	+ 3.51	+ 3.51	+ 3.51
June		9.17	11.44	− 2.27	− 2.27	− 2.27	− 2.27
July		7.79	9.66	− 1.87	− 1.87	− 1.87	− 1.87
August		5.54	6.52	− .98	− .98	− .98	− .98
September		1.45	2.22	− .77	− .77	− .77	− .77
October		2.91	2.45	+ 3.12	+ .46	+ .46	+ .46
November		1.66	3.40		+ .06	− 1.74	− 1.74
						+ .56	+ 6.03

RAINFALL AT PLANTATION PROVIDENCE, BERBICE.

Month.		Rainfall 1935—1936, Inches.	Average Rainfall 1909—1936, Inches.	Excess or Deficit during Growth of the Experiment.
				Field 14 E.W.
June	1935	21.98	12.27	+ 9.71
July		12.07	11.44	+ .63
August		10.41	7.07	+ 3.34
September		5.16	2.64	+ 2.52
October		5.16	2.93	+ 2.23
November		.70	3.44	− 2.74
December		2.88	10.46	− 7.58
January	1936	4.02	8.87	− 4.85
February		1.26	5.63	− 4.37
March		15.23	5.11	+10.12
April		12.52	6.17	+ 6.35
May		11.94	11.20	+ .74
June		10.80	12.27	− 1.47
July		7.16	11.44	− 4.28
August		8.13	7.07	+ 1.06
September		.73	2.64	− 1.91
				− 9.50

RAINFALL AT PLANTATION CANE GROVE.

Month.	Rainfall 1936-1937, Inches.	Average Rainfall 1916-1936, Inches.	Excess or Deficit during Growth of the Various Experiments.		
			Field 50 S.M., A.B.	Fields 17 P. & 63 M.	Field 53 M.
March 1936	9.53	3.95	+ 5.58		
April	13.77	5.93	+ 7.84	+ 7.84	+ 7.84
May	9.96	11.15	− 1.19	− 1.19	− 1.19
June	11.05	11.60	− .55	− .55	− .55
July	4.92	9.76	− 4.84	− 4.84	− 4.84
August	2.67	6.75	− 4.08	− 4.08	− 4.08
September	1.60	2.43	− .83	− .83	− .83
October	3.45	3.55	− .10	− .10	− .10
November	2.09	5.40	− 3.31	− 3.31	− 3.31
December	13.76	11.55	+ 2.21	+ 2.21	+ 2.21
January 1937	11.50	7.68	+ 3.82	+ 3.82	+ 3.82
February	.76	3.90	− 3.14	− 3.14	− 3.14
March	.85	3.95	− 3.10	− 3.10	− 4.17
			− 1.69	− 7.27	

RAINFALL AT PLANTATION ENMORE.

Month.	Rainfall 1935—1937, Inches.	Average Rainfall 1913—1936, Inches.	Excess or Deficit during Growth of the Various Experiments.			
			Field 16 E.P.	Field 8 B.A.	Field 15 B.A.	Field 13 H. A. B.
October 1935	4.81	3.15	+ 1.66			
November	5.30	5.78	− .48			
December	4.67	11.27	− 6.60			
January 1936	5.60	8.14	− 2.54			
February	2.79	4.10	− 1.31			
March	11.90	4.37	+ 7.53	+ 7.53		
April	10.85	5.47	+ 5.38	+ 5.38	+ 5.38	
May	9.53	10.94	− 1.41	− 1.41	− 1.41	− 1.41
June	11.91	11.80	+ .11	+ .11	+ .11	+ .11
July	4.63	8.91	− 4.28	− 4.28	− 4.28	− 4.28
August	1.27	6.05	− 4.78	− 4.78	− 4.78	− 4.78
September	1.26	2.36	− 6.72	− 1.10	− 1.10	− 1.10
October	4.51	3.15		+ 1.36	+ 1.36	+ 1.36
November	2.57	5.78		− 3.21	− 3.21	− 3.21
December	15.13	11.27		+ 3.86	+ 3.86	+ 3.86
January 1937	7.99	8.14		− .15	− .15	− .15
February	.49	4.10		+ 3.31	− 3.61	− 3.61
March	.87	4.37			− 3.50	− 3.50
April	3.91	5.47			−11.33	− 1.56
						−18 27

RAINFALL AT PLANTATION LA BONNE INTENTION.

Month.		Rainfall 1935—1937, Inches.	Average Rainfall 1916—1936, Inches.	Excess or Deficit during Growth of the Various Experiments.		
				Field 45 M.W.	Field 22 C.M.	Field 36 L.R.
June	1935	14.62	12.25	+ 2.37		
July		7.10	9.59	− 2.49		
August		8.00	6.99	+ 1.01		
September		5.02	2.37	+ 2.65		
October		5.70	3.36	+ 2.34		
November		4.69	6.52	− 1.83		
December		3.70	12.19	− 8.49	− 8.49	
January	1936	5.42	8.61	− 3.19	− 3.19	
February		2.79	3.94	− 1.15	− 1.15	
March		9.68	4.66	+ 5.02	+ 5.02	
April		11.88	5.20	+ 6.68	+ 6.68	+ 6.68
May		12.97	11.23	+ 1.74	+ 1.74	+ 1.74
June		9.79	12.25	− 2.46	− 2.46	− 2.46
July		9.54	9.59	− .05	− .05	− .05
August		1.59	6.99	− 5.40	− 5.40	− 5.40
September		1.36	2.37	− 3.25	− 1.01	− 1.01
October		3.02	3.36		− .34	− .34
November		2.60	6.52		− 8.65	− 3.92
December		17.80	12.19			+ 5.61
January	1937	10.91	8.61			+ 2.30
February		.74	3.94			− 3.20
March		1.23	4.66			− 3.43
						− 3.48

RAINFALL AT PLANTATION LUSIGNAN.

Month.		Rainfall 1935—1937, Inches.	Average Rainfall 1887—1936, Inches.	Excess or Deficit during Growth of the Various Experiments.			
				Field 76 A.	Field 26 W.	Fields 40 W. & 4 Emp.	Field 85 M.R.
July	1935	7.60	9.20	− 1.60			
August		7.10	5.48	+ 1.62	+ 1.62		
September		5.21	2.21	+ 3.00	+ 3.00		
October		6.16	2.42	+ 3.74	+ 3.74		
November		5.21	4.92	+ .29	+ .29		
December		4.28	10.89	− 6.61	− 6.61		
January	1936	5.66	8.03	− 2.37	− 2.37		
February		2.82	5.05	− 2.23	− 2.23		
March		12.47	6.08	+ 6.39	+ 6.39	+ 6.39	
April		11.36	6.15	+ 5.21	+ 5.21	+ 5.21	+ 5.21
May		11.14	10.62	+ .52	+ .52	+ .52	+ .52
June		10.04	11.49	− 1.45	− 1.45	− 1.45	− 1.45
July		8.64	9.20	− .56	− .56	− .56	− .56
August		1.77	5.48	− 3.71	− 3.71	− 3.71	− 3.71
September		2.49	2.21	+ 2.24	+ 3.84	+ .28	+ .28
October		3.31	2.42			+ .89	+ .89
November		3.49	4.92			− 1.43	− 1.43
December		18.77	10.89			+ 7.88	+ 7.88
January	1937	11.47	8.03			+ 3.44	+ 3.44
February		1.13	5.05			− 3.92	− 3.92
March		1.19	6.08			+ 13.54	+ 7.15
April		5.10	6.15				

RAINFALL AT PLANTATION OGLE.

Month.		Rainfall 1935—1936, Inches.	Average Rainfall 1906—1936, Inches.	Excess or Deficit during Growth of the Various Experiments.	
				Field 109 E.	Fields 61 O. & 45 O.
September	1935	4.25	2.30	+ 1.95	
October		3.41	3.34	+ .07	+ .07
November		4.86	5.16	− .30	− .30
December		4.03	11.04	− 7.01	− 7.01
January	1936	6.79	7.83	− 1.04	− 1.04
February		2.32	4.51	− 2.19	− 2.19
March		10.74	5.45	+ 5.29	+ 5.29
April		12.02	5.70	+ 6.32	+ 6.32
May		12.58	11.23	+ 1.35	+ 1.35
June		12.97	11.19	+ 1.78	+ 1.78
July		9.57	9.66	− .09	− .09
August		1.63	7.01	− 5.38	− 5.38
September		1.56	2.30	− .74	− .74
				+ .01	− 1.94

RAINFALL AT PLANTATION DIAMOND.

Month.		Rainfall 1935—1936, Inches.	Average Rainfall 1890—1936, Inches.	Excess or Deficit during Growth of the Experiment. Field 97G.D.
September	1935	4.09	3.78	+ .31
October		3.37	4.02	— .65
November		2.09	5.92	— 3.83
December		4.54	12.28	— 7.74
January	1936	6.27	9.54	— 3.27
February		2.95	5.91	— 2.96
March		11.88	7.59	+ 4.29
April		11.05	7.26	+ 3.79
May		10.78	12.69	— 1.91
June		13.53	14.09	— .56
July		9.54	11.25	— 1.71
August		2.95	7.93	— 4.98
September		6.15	3.78	+ 2.37
October		3.81	4.02	— .21
November		3.98	5.92	— 1.94
				—19.00

RAINFALL AT PLANTATION WALES.

Month.		Rainfall 1936–1937, Inches.	Average Rainfall 1906–1936, Inches.	Excess or Deficit during Growth of the Various Experiments. Field 9 C.	Field 39 V. A, B.
March	1936	11.71	7.05	+ 4.66	
April		13.58	6.92	+ 6.66	+ 6.66
May		11.05	13.63	— 2.58	— 2.58
June		12.19	14.46	— 2.27	— 2.27
July		10.61	11.56	— .95	— .95
August		5.07	8.22	— 3.15	— 3.15
September		6.18	3.80	+ 2.38	+ 2.38
October		3.14	4.27	— 1.13	— 1.13
November		4.44	6.26	— 1.82	— 1.82
December		18.75	12.75	+ 6.00	+ 6.00
January	1937	13.86	9.37	+ 4.49	+ 4.49
February		.73	5.31	— 4.58	— 4.58
March		1.36	7.05	+ 7.71	— 5.69
					— 2.64

RAINFALL AT PLANTATION LEONORA.

Month.		Rainfall 1935—1937, Inches.	Average Rainfall 1906—1936, Inches.	Excess or Deficit during Growth of the Various Experiments.	
				Field 16 Gv.	Field 53 Sv., A,B.
October	1935	6.20	3.75	+ 2.45	
November		6.06	6.39	— .33	
December		5.56	11.69	— 6.13	
January	1936	7.37	9.12	— 1.75	
February		2.61	5.05	— 2.44	
March		11.45	5.46	+ 5.99	
April		13.48	5.60	+ 7.88	+ 7.88
May		11.59	12.90	— 1.31	— 1.31
June		13.97	12.65	+ 1.32	+ 1.32
July		8.34	10.81	— 2.47	— 2.47
August		4.38	7.17	— 2.79	— 2.79
September		.96	2.78	— 1.82	— 1.82
October		3.96	3.75	— 1.40	+ .21
November		4.51	6.39		— 1.88
December		17.50	11.69		+ 5.81
January	1937	14.04	9.12		+ 4.92
February		.81	5.05		— 4.24
March		1.84	5.46		— 3.62
April		6.21	5.60		+ .61
					+ 2.62

RAINFALL AT PLANTATION UITVLUGT.

Month.		Rainfall 1935-1937, Inches.	Average Rainfall 1916-1936, Inches.	Excess or Deficit during Growth of the Various Experiments.			
				Field 46 deW.	Field 31 E.	Field 42 W.	Field 13 E.
October	1935	6.80	4.65	+ 2.15			
November		4.57	7.26	— 2.69			
December		6.28	13.63	— 7.35			
January	1936	8.45	9.75	— 1.30			
February		3.29	4.48	— 1.19			
March		11.48	5.00	+ 6.48	+ 6.48		
April		14.47	5.91	+ 8.56	+ 8.56	+ 8.56	— 8.56
May		12.47	13.20	— .73	— .73	— .73	— .73
June		13.36	14.43	— 1.07	— 1.07	— 1.07	— 1.07
July		8.17	11.60	— 3.43	— 3.43	— 3.43	— 3.43
August		4.39	7.74	— 3.35	— 3.35	— 3.35	— 3.35
September		1.50	3.28	— 1.78	— 1.78	— 1.78	— 1.78
October		3.24	4.65	— 1.41	— 1.41	— 1.41	— 1.41
November		3.27	7.26	— 3.99	— 3.99	— 3.99	— 3.99
December		17.06	13.63	+ 3.43	+ 3.43	+ 3.43	+ 3.43
January	1937	16.54	9.75	+ 6.79	+ 6.79	+ 6.79	+ 6.79
February		1.30	4.48	— 3.18	— 3.18	— 3.18	— 3.18
March		1.92	5.00	— 4.06	— 3.08	— 3.08	— 3.08
April		7.46	5.91		+ 3.24	— 3.24	+ 1.55
							— 1.69

APPENDIX II.

(*a*) Soils of Variety Trial Sites.

Plantation :—	Sophia Sugar Experiment Station.													
Field No. :—	1 E. A. B. C. D.		2 E.		3 E. A, B.		8 E. A. B.		9 E. A, B, C.		10 E. A. B.		12 E.	
Sample No. :—	D. 1233	D. 1234	D. 1094	D. 1095	D. 900	D. 901	D. 1118	D. 1119	D. 1239	D. 1240	D. 1241	D. 1242	D. 883	D. 884
Sampling Depth :—	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	5.91	6.85	6.34	5.44	5.73	6.54	5.74	7.32	5.94	7.42	6.31	6.85	6.44	6.99
Exchange pH	5.03	6.19	4.66	4.29	4.49	5.45	4.80	6.56	4.29	6.51	4.97	6.11	5.41	5.91
M.P.S.	47.3	45.8	53.3	54.3	44.1	49.2	46.5	46.4	45.3	48.2	48.7	46.2	45.9	44.8
% Sand	5.5	10.4	3.0	4.0	2.5	1.7	8.0	4.0	7.0	2.7	7.2	6.0	5.0	1.9
Index of Texture	46	44	53	54	44	49	45	46	44	48	47	45	45	44
% Soluble Salts	0.110	0.239	0.076	0.174	0.066	0.220	0.159	0.226	0.028	0.202	0.044	0.269	0.038	0.129
% Organic Matter	1.60	0.89	1.79	1.15	1.77	0.75	1.68	0.98	1.40	0.69	1.10	0.73	1.61	0.99
%Nitrogen	0.143	0.098	0.142	0.117	0.156	0.096	0.105	0.088	0.125	0.078	0.112	0.078	0.139	0.111
Carbon/Nitrogen ratio	6.51	5.44	7.3	5.7	6.57	4.56	9.3	6.5	6.48	5.12	5.75	5.44	6.73	5.20
Rate of Solution	179	—1	110	13	23	3	33	37	45	33	129	0	131	69
Lime Requirement. Ton/acre $CaCO_3$	3.27	1.68	4.0	4.5	3.87	1.71	2.5	0.5	4.20	0.43	2.85	1.20	2.98	1.55

Appendix II (*Contd.*).

(*a*) Soils of Variety Trial Sites.

Plantation : –	Sophia Sugar Experiment Station.												Port Mourant	
Field No. :—	3 W.		5 W.		7 W.		8 W.		9 W.		15 W.		11 T.L.	
Sample No. :—	D. 1096	D. 1097	D. 1112	D. 1113	D. 1114	D. 1115	D. 1116	D. 1117	D. 1068	D. 1069	D. 1108	D. 1109	B. 261	B. 262
Sampling Depth :—	0—1 ft.	1—2 ft	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	5.47	5.45	6.44	7 39	6.55	7.99	7.13	7.83	6.31	7.22	5.96	6.82	5.18	5.34
Exchange pH	3.92	4.33	5.17	6.24	5.20	6.75	6.19	6.75	5.40	6.45	4.53	5.69	4.12	4.38
M.P.S.	52.4	55.0	47.3	52.6	44.5	50.5	43.9	50.0	43.7	43.5	39.3	40.3	53.7	53.7
% Sand	3.9	2.5	4.9	4.0	7.0	8.0	8.0	7.5	3.2	2.9	26.2	25.0	5.5	1.7
Index of Texture	52	55	46	52	43	49	42	49	43	43	34	35	53	53
% Soluble Salts	0.049	0.126	0.058	0.154	0.047	0.139	0.084	0.159	0.084	0.139	0.022	0.070	0.077	0.124
% Organic Matter	1.60	0.73	1.70	0.88	1.76	0.75	1.46	0.76	1.35	0.77	1.28	0.96	3.28	1.60
% Nitrogen	0.122	0.094	0.119	0.084	0.126	0.081	0.126	0.063	0.108	0.088	0.124	0.070	0.243	0.141
Carbon/Nitrogen ratio	7.6	4.5	8.27	6.25	8.12	5.36	6.71	6.98	7.26	5.09	6.0	7.9	7.83	6.58
Rate of Solution	15	18	210	60	217	106	232	93	123	66	115	134	39	7
Lime requirement, Ton/acre $CaCO_3$	6.7	3.4	2.8	0.6	2.5	...	1.0	...	2.4	0.8	2.5	0.9	7.1	4.1

APPENDIX II (*Contd.*).

(*a*) SOILS OF VARIETY TRIAL SITES.

Plantation :—	PROVIDENCE.		BLAIRMONT.				CANE GROVE.				ENMORE.			
Field No. :—	14 E.W.		24 Rp.		4 H.		50 S.M. A, B.		17 P.		13 H. A, B.		15 B.A.	
Sample No. :—	B. 332	B. 333	B. 282	B. 283	B. 98	B. 99	D. 1200	D. 1201	D. 1084	D. 1085	D. 1219	D. 1220	D. 1080	D. 1081
Sampling Depth :—	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	4.78	4.75	5.15	5.40	4.95	5.44	4.59	4.56	4.46	4.87	5.17	4.99	4.56	4.68
Exchange pH	3.70	3.95	4.17	4.54	3.78	4.01	3.68	3.66	3.82	3.89	4.10	4.14	3.70	3.69
M.P.S.	51.4	52.1	49.5	46.3	56.1	50.1	57.0	58.9	61.9	54.2	50.6	53.3	51.7	52.0
% Sand	8.4	2.4	6.0	3.5	7.7	2.6	7.0	6.5	7.3	4.0	6.5	2.5	8.3	11.1
Index of Texture	50	52	48	46	55	50	57	58	61	53	49	53	50	50
% Soluble Salts	0.037	0.112	0.046	0.077	0.028	0.033	0.034	0.029	0.017	0.019	0.064	0.169	0.022	0.027
% Organic Matter	2.16	0.79	4.94	2.83	6.11	1.69	6.32	5.13	7.83	3.10	2.17	0.89	3.75	2.07
% Nitrogen	.211	.095	0.323	0.159	0.337	0.128	0.337	0.223	0.471	0.207	0.165	0.081	0.226	0.133
Carbon/Nitrogen ratio	5.94	4.86	9.05	10.30	10.52	7.66	10.88	13.34	9.64	11.44	7.62	6.41	9.64	9.05
Rate of Solution	18	20	6	20	24	11	16	24	6	16	50	28	6	18
Lime Requirement, Ton/acre $CaCO_3$	9.7	5.5	7.8	4.6	9.11	4.11	19.3	18.4	19.3	14.2	7.0	5.0	17.6	15.6

Appendix II (*Contd.*).

(*a*) Soils of Variety Trial Sites.

Plantation :—	Lusignan.				La Bonne Intention.						Ogle.			
Field No. :—	76 A.		40 W.		45 M.		36 L.R.		22 C.M.		109 E.		61 O.	
Sample No. :—	D. 1090	D. 1091	D. 1056	D. 1057	D. 1086	D. 1087	D. 1078	D. 1079	D. 805	D. 806	D. 1102	D. 1103	D. 672	D. 673
Sampling Depth :—	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	5.00	5.10	4.75	4.78	5.51	7.17	5.34	5.91	5.37	5.23	5.27	6.11	5.24	5.06
Exchange pH	3.65	4.07	3.63	3.87	4.05	6.02	4.19	5.25	4.17	4.20	4.11	4.97	3.89	4.00
M.P.S.	50.5	48.5	42.8	51.3	47.7	49.7	42.5	45.0	43.4	46.6	45.3	50.8	38.1	47.2
% Sand	9.0	7.5	13.0	3.7	7.4	3.7	2.5	1.7	9.2	4.8	22.9	7.8	10.0	6.1
Index of Texture	49	47	40	51	46	49	42	45	42	46	39	49	36	46
% Soluble Salts	0.020	0.057	0.028	0.104	0.035	0.102	0.051	0.202	0.028	0.070	0.031	0.071	0.032	0.099
% Organic Matter	1.279	0.621	2.55	1.17	1.117	0.531	1.89	0.86	1.59	1.19	1.72	0.76	1.73	1.13
% Nitrogen	0.156	0.095	0.150	0.105	0.127	0.025	0.156	0.091	0.091	0.105	0.147	0.098	0.108	0.097
Carbon/Nitrogen ratio	8.19	6.54	9.84	6.46	8.79	21.24	7.03	5.46	10.46	6.58	7.8	4.5	9.28	6.73
Rate of Solution	18	38	−5	−3	44	71	103	61	284	177	63	14	394	13
Lime Requirement, Ton/acre $CaCO_3$	10.0	4.4	9.7	8.0	5.5	0.5	5.7	2.4	5.80	4.60	5.8	2.5	5.84	4.91

APPENDIX II (*Contd.*).

(*a*) SOILS OF VARIETY TRIAL SITES.

Plantation :—	DIAMOND.		WALES.		LEONORA.				UITVLUGT.					
Field No. :—	97 G.D.		39 V. A, B.		16 G.V.		53 Sv. A, B.		46 de W.		13 E.		4 2 W.	
Sample No. :—	D. 1100	D. 1101	D. 1203	D. 1204	D. 1106	D. 1107	D. 1198	D. 1199	D. 1104	D. 1105	D. 1205	D. 1206	D. 1058	D. 1059
Sampling Depth :—	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	5.34	5.03	4.66	5.04	5.23	5.29	4.83	4.83	4.71	4.60	5.04	5.55	4.85	5.05
Exchange pH	3.97	3.79	3.65	3.82	4.19	3.97	3.66	3.77	3.82	3.72	3.75	4.07	4.11	3.99
M.P.S.	58.2	56.4	52.0	56.7	45.6	47.2	45.4	49.5	63.7	58.0	47.4	54.8	54.7	49.7
% Sand	6.5	5.0	7.0	3.5	10.3	12.5	5.4	8.0	5.5	3.2	10.0	4.5	6.2	1.5
Index of Texture	57	55	51	56	44	45	44	48	63	57	45	54	54	49
% Soluble Salts	0.025	0.016	0.011	0.010	0.017	0.055	0.016	0.015	0.031	0.012	0.018	0.021	0.023	0.012
% Organic Matter	0.84	3.03	2.12	1.11	1.19	0.96	2.25	1.85	5.82	2.35	1.72	0.97	6.34	1.60
% Nitrogen	0.158	0.108	0.165	0.098	0.092	0.091	0.182	0.157	0.285	0.147	0.133	0.087	0.277	0.140
Carbon/Nitrogen ratio	3.1	16.2	7.46	6.56	6.9	5.7	7.16	6.83	11.8	9.2	7.51	6.50	13.26	6.65
Rate of Solution	–15	–9	9	20	49	11	19	11	–8	3	42	25	6	–4
Lime Requirement, Ton/acre $CaCO_3$	12.9	13.7	13.6	11.8	5.9	4.6	13.8	14.0	17.5	13.7	8.6	4.9	13.7	10.0

Appendix II *(Contd.)*.

(*b*) Soils of Manurial Trial Sites.

Plantation :—	Skeldon.						Port Mourant.		Albion.		Rose Hall.			
Field No. :—	7 Eliza and Mary.		8 Eliza and Mary.		8 Springlands.		13 Resource.		31 Kilcoy.		30 Rose Hall.		81 Rose Hall.	
Sample No. :—	B. 263	B. 264	B. 266	B. 265	B. 267	B. 268	B. 210	B. 211	B. 255	B. 256	B. 108	B. 109	B. 394	B. 395
Sampling Depth :—	0—1 ft	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft	1—2 ft.	0—1 ft	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	4.55	4.73	4.92	4.95	5.52	4.73	4.97	4.97	6.17	6.14	5.77	6.09	5.35	6.24
Exchange pH	3.86	4.06	3.96	4.26	5.07	4.28	4.05	4.24	5.27	5.52	4.80	5.08	4.49	5.40
M.P.S.	50.1	54.2	52.0	52.3	50.3	53.5	51.4	52.7	52.5	54.7	50.4	51.7	50.5	52.2
% Sand	6.0	4.7	7.7	5.7	5.2	7.5	3.7	2.4	3.9	1.5	3.7	2.6	5.6	5.0
Index of Texture	49	53	51	51	49	52	51	52	52	54	50	51	49	51
% Soluble Salts	0.135	0.265	0.064	0.165	0.371	0.349	0.061	0.154	0.070	0.204	0.048	0.143	0.082	0.185
% Organic Matter	3.05	1.67	2.81	2.62	1.10	2.07	2.74	1.23	2.95	1.37	2.00	1.36	2.42	1.65
% Nitrogen	0.251	0.156	0.237	0.219	0.135	0.226	0.199	0.140	0.230	0.143	0.157	0.109	0.179	0.122
Carbon/Nitrogen ratio	7.04	6.20	6.86	6.64	4.71	5.33	7.99	5.09	7.43	6.70	7.40	7.25	7.8	7.8
Rate of Solution	—2	—43	—117	—189	—54	—47	16	—4	151	51	306	—2	72	33
Lime Requirement. Tons/acre $CaCO_3$	8.0	5.0	7.1	5.3	2.5	5.2	11.2	5.0	4.0	2.1	3.36	1.73	5.34	2.28
Available P_2O_5 p.p.m. (Truog)	14	<10	<10	<10	<10	<10	18	21	18	40	16	24	...	56
Citric P_2O_5 p.p.m.	33	12	42	21	8	18	75	23	41	32	44	26	0.0056	0.0045
Exch. and water sol. bases mg. eqs./100 gms.														
Lime	4.15	3.35	5.60	4.62	2.47	6.33	6.02	5.55	10.56	8.24	10.40	12.00	7.55	7.42
Magnesia	9.02	12.20	5.95	11.58	8.95	16.48	9.83	12.69	12.72	16.67	12.30	15.95	13.05	14.78
Potash	0.27	0.24	0.43	0.31	0.33	0.29	0.34	0.31	0.34	0.34	0.14	0.23	0.31	0.29
Soda	0.70	2.97	0.73	0.72	3.25	0.80	1.19	1.89	1.18	2.58	0.15	0.72	1.51	2.22

APPENDIX II (*Contd.*).

(*b*) SOILS OF MANURIAL TRIAL SITES.

Plantation :—	ROSE HALL.		BLAIRMONT.				CANE GROVE.				ENMORE.			
Field No. :—	20 Tappinsburg.		71 Bush Lot.		26 Rampoor.		53 Melville.		63 Melville.		8 Bachelor's Adventure.		16 East Paradise.	
Sample No. :—	B. 212	B. 213	B. 224	B. 225	B. 376	B. 377	D. 910	D. 911	D. 904	D. 905	D. 716	D. 717	D. 964	D. 965
Sampling Depth :—	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	5.20	5.25	5.34	5.42	5.05	6.12	4.70	4.92	4.83	3.28	5.28	5.22	4.77	4.65
Exchange pH	4.10	4.37	3.92	4.63	4.19	5.00	3.60	3.72	3.86	3.02	4.21	4.09	3.52	3.60
M.P.S.	50.8	52.7	50.7	48.4	53.0	48.2	49.9	47.6	52.7	57.2	48.4	50.3	51.9	54.0
% Sand	4.4	5.1	8.9	3.7	5.4	1.5	2.7	3.7	5.0	4.5	2.7	2.0	2.5	2.0
Index of Texture	50	52	49	48	52	48	49	47	52	56	48	50	51	54
% Soluble Salts	0.039	0.090	0.036	0.137	0.062	0.105	0.020	0.018	0.033	0.339	0.098	0.183	0.036	0.070
% Organic Matter	2.10	1.74	2.70	1.21	3.22	0.68	4.15	1.89	7.18	12.0	2.16	1.29	2.73	1.74
% Nitrogen	0.168	0.156	0.241	0.129	0.260	0.087	0.189	0.147	0.348	0.285	0.155	0.102	0.204	0.150
Carbon/Nitrogen ratio	7.24	6.46	6.49	5.44	7.2	4.5	12.8	7.45	12.0	24.4	8.10	7.34	7.78	6.76
Rate of Solution	45	54	137	42	39	35	2	12	12	49	1.70	55	51	14
Lime Requirement, Ton/acre $CaCO_3$	6.0	4.0	8.5	3.4	7.6	2.4	15.7	13.0	15.0	14.4	5.45	3.69	13.3	12.6
Available P_2O_5 p.p.m. (Truog)	18	20	26	19	82	84	10	10	10	10	52	30	11	10
Citric P_2O_5 p.p.m.	31	23	116	22	0.0036	0.0012	26	8	38	11	208	56	92	36
Exch. and water sol. bases mg. eqs./100 gms.														
Lime	5.40	4.41	6.60	4.62	4.77	2.45	3.90	3.65	3.57	3.75	7.70	5.10	6.00	5.10
Magnesia	11.53	10.84	4.87	13.30	13.25	13.83	2.93	7.35	2.86	5.93	10.05	12.60	7.41	9.83
Potash	0.38	0.31	0.57	0.23	0.35	0.34	0.44	0.32	0.39	0.18	0.47	0.39	0.51	0.38
Soda	0.90	1.12	1.42	3.07	1.23	3.40	0.27	0.52	0.46	0.60	1.24	3.71	0.64	1.21

Appendix II (*Contd.*).

(*b*) Soils of Manurial Trial Sites.

Plantation :—	Lusignan						Ogle.		Wales.		Uitvlugt	
Field No. :—	26 West.		4 Empolder.		85 Mon Repos.		45 Ogle A, B.		9 Cottage.		31 East.	
Sample No. :—	D. 1018	D. 1019	D. 706	D. 707	D. 1088	D. 1089	D. 1020	D. 1021	D. 890	D. 891	D. 1120	D. 1121
Sampling Depth :—	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	5.97	6.21	5.00	4.85	4.97	4.94	4.98	5.07	4.59	4.72	4.85	5.05
Exchange pH	4.90	5.29	3.57	3.77	3.75	4.09	3.62	3.84	4.06	4.02	4.14	3.94
M.P.S.	45.6	47.2	59.3	59.3	50.5	51.1	47.6	50.4	64.9	56.8	59.4	46.9
% Sand	1.7	2.7	2.8	2.1	9.5	3.0	7.7	2.5	6.6	5.7	10.0	5.5
Index of Texture	45	47	59	59	49	51	46	50	64	56	57	46
% Soluble Salts	0.046	0.166	0.021	0.032	0.009	0.058	0.038	0.107	0.041	0.040	0.053	0.009
% Organic Matter	1.56	0.97	3.80	2.55	2.39	1.84	1.94	1.15	6.93	3.06	8.33	1.36
% Nitrogen	0.140	0.100	0.263	0.169	0.154	0.116	0.143	0.116	0.350	0.266	0.425	0.120
Carbon/Nitrogen ratio	6.48	5.64	8.39	8.74	9.00	9.20	7.85	5.75	11.5	6.65	11.40	6.50
Rate of Solution	43	51	−6	−10	4	18	16	2	−6	−7	37	1
Lime Requirement, Ton/acre $CaCO_3$	3.0	1.8	14.78	9.83	11.0	6.7	9.0	6.6	17.4	13.1	13.0	8.9
Available P_2O_5 p.p.m. (Truog)	29	25	15	15	10	Trace	28	16	38	20	60	Trace
Citric P_2O_5 p.p.m.	91	28	139	71	0.0088	0.0022	133	46	167	67	0.0050	0.0046
Exch. and Water Sol. bases mg. eqs./100 gms.												
Lime	10.47	6.20	5.56	5.36	4.15	4.80	5.44	5.02	2.74	1.55	4.76	3.04
Magnesia	12.06	16.40	0.04	9.00	6.20	12.03	14.26	11.77	4.35	3.67	1.39	2.46
Potash	0.59	0.27	0.42	0.31	0.25	0.89	0.60	0.27	0.18	0.16	0.47	0.11
Soda	1.33	3.28	0.29	0.60	0.97	0.28	0.90	2.86	0.15	0.11	0.56	0.22

APPENDIX II *(Contd.)*.

(*c*) SOILS OF FLOOD-FALLOW TRIAL SITES.

Plantation :—	PORT MOURANT			
Field No :—	28 Tain Windward.		28 Tain Leeward.	
Sample No :—	B. 100	B. 101	B. 102	B. 103
Sampling Depth :—	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	5.79	6.56	5.92	6.29
Exchange pH	4.73	5.52	4·73	5.42
M.P.S.	50.6	52.0	51.1	56.0
% Sand	2.5	2.1	3.2	1.3
Index of Texture	50	52	50	56
% Soluble Salts	0.089	0.224	0.095	0.243
% Organic Matter	2.46	1.01	2.71	1.04
% Nitrogen	0.178	0.101	0.169	0.095
Carbon/Nitrogen ratio	8.017	5.792	9.315	6.348
Rate of Solution	58	11	12	43
Lime Requirement, Ton/acre $CaCO_3$	3.51	1.46	3.49	1.39

APPENDIX III.

Calendar of Agricultural Operations on Manurial Trial Sites.

Experiment No.	Page of Bulletin.	Estate.	Field.	Variety.	System of Replication.	Size of Plots, Acres.	Date of Planting.	Date of Applying Limestone and/or Slaked Lime.	Date of Applying Potash.	Date of Applying Superphosphate.	Date of Applying Sulphate of Ammonia.	Date of Flooding Field.	Date of Reaping.
A 7	68	Skeldon	7 E.M.	Diamond 10	Three four by four Latin Squares	0.034	1933	—	—	—	12.X.34[2] 24.X.35[3]	—	4.X.34[1] 2.X.35[2] 23.IX.36[3]
A 5	66	..	8 E.M.	P.O.J. 2878	Three four by four Latin Squares	0.034	1933	—	—	—	12.X.34[2] 24.X.35[3]	—	4.X.34[1] 1.X.35[2] 22.IX.36[3]
A 3	62	,,	8 Sp.	P.O.J. 2878	Three four by four Latin Squares	0.027	8.IX.34	—	—	—	13.X.34[1] 24.X.35[2]	—	3.X.35[1] 24.IX.36[2]
C 3	83	Port Mourant	13 R.	D. 625	A five by five Latin Square	0.051	6.I.34	26.I.34[1, 5]	—	27.II.34[1] 28.III.35[2]	—	21.IV.33 to 23.XII.33	14.III.35[1] 27.II.36[2] 10.III.37[3]
B 2	80	Albion	31 K.	D. 625	A five by five Latin Square	0.041	31.VIII.34	5.IX.34[1]	—	—	—	For 10 months previous to planting	17.IX.35[1] 17.IX.36[2]
A 8	70	Rose Hall	30 R.H.	D. 625	A four by four Latin Square	0.048	27.I.33	2.II.33[1, 5]	13.IV.33[1, 5] 26.III.35[3, 5]	13.IV.33[1, 5]	2.III.33[1] 24.III.34[2] 26.III.35[3] 18.III.36[4]	For 4½ months previous to planting	7.III.34[1] 5.III.35[2] 25.II.36[3] 3.II.37[4]
A 1	57	..	81 R.H.	P.O.J. 2878	Three by three by three Factorial	0.041	11.I.36	18.I.36[1, 5]	26.II.36[1]	26.II.36[1]	26.II.36[1]	—	27.I.37[1]

[1]Plants. [2]First Ratoons. [3]Second Ratoons. [4]Third Ratoons. [5]Basic Application.

APPENDIX III (*Contd.*).

CALENDAR OF AGRICULTURAL OPERATIONS ON MANURIAL TRIAL SITES.

Experiment No.	Page of Bulletin.	Estate.	Field.	Variety.	System of Replication.	Size of Plots, Acres.	DATE OF						
							Planting.	Applying Limestone and/or Slaked Lime.	Applying Potash.	Applying Superphosphate.	Applying Sulphate of Ammonia.	Flooding Field.	Reaping.
C 4	83	Rose Hall	20 T.	D 625	A five by five Latin Square	0.051	27.III.34	5.V.34[1, 5]	—	6.IV.34[1] 26.III.35[2] 18.III.36[3]	—	9.IX.33 to 27.II.34	12.III.35[1] 26.II.36[2] 3.II.37[3]
B 1	80	Blairmont	71 B.L.	D. 625	A five by five Latin Square	0.051	4.VIII.34	10.VIII.34[1]	—	—	—	—	10.X.35[1] 7.X.36[2]
A 2	58	„	26 Rp.	P.O.J.2878	Three by three by three Factorial	0.041	6.XII.35	25.I.36[1, 5]	24.II.36[1]	24.II. 36[1]	24.II.36[1]	—	25.XI.36[1]
C 6	85	Cane Grove	53 M.	P.O.J 2878	A five by five Latin Square	0.051	14.IV.34	—	—	15.VI.34[1] 19.VI.35[2] 29.IV,36[3]	—	—	21.V.35[1] 9.IV.36[2] 18.III.37[3]
A 12	75	„	63 M.	D. 625	A five by five Latin Square	0.054	31.III.34	11.V.34[1, 5]	—	11.V.34[1, 5]	15.VI.34[1] 19.VI.35[2] 29.IV.36[3]	—	3.V.35[1] 2.IV.36[2] 17.III.37[3]
A 9	70	Enmore	8 B.A.	D. 625	A four by four Latin Square	0.051	2.XII.32	2.XII.32[1, 5]	—	—	10.I.33[1] 29.III.34[2] 14.III.35[3] 28.III.36[4]	26.III.32 to 21.XI.32	23.II.34[1] 12.II.35[2] 3.III.36[3] 2.II.37[4]
B 3	80	„	16 E.P.	Diamond 10	A five by five Latin Square	0.051	28.VII.34	31.VII.34[1]	—	—	—	For one year previous to planting	2.X.35[1] 8.IX.36[2]

[1]Plants. [2]First Ratoons. [3]Second Ratoons. [4]Third Ratoons. [5]Basic Application.

APPENDIX III (*Contd.*).

CALENDAR OF AGRICULTURAL OPERATIONS ON MANURIAL TRIAL SITES.

Experiment No.	Page of Bulletin.	Estate.	Field.	Variety	System of Replication.	Size of Plots, Acres.	DATE OF						
							Planting.	Applying Limestone and/or Slaked Lime.	Applying Potash.	Applying Basic Slag.	Applying Sulphate of Ammonia.	Flooding Field.	Reaping.
A 14	78	Lusignan	4 Emp.	D. 625	A five by five Latin Square	0.051	18.XII.32	9.I.33[1,5]	—	—	9.II.33[1] 10.IV.34[2] 15.II.35[3] 27.III.36[4]	October 1931 to November 1932	27.II.34[1] 12.II.35[2] 20.II.36[3] 18.II.37[4]
A 6	66	,,	26 W.	P.O.J. 2878	Three four by four Latin Squares	0.034	1933				25.IX.34[2] 5.IX.35[3]		11.IX.34[1] 21.VIII.35[2] 3.IX.36[3]
A 10	70	,,	85 M.R.	D. 625	A four by four Latin Square	0.042	1933				24.VI.35[3] 2.V.36[4]		1934[1] 27.IV.35[2] 31.III.36[3] 24.II.37[4]
A 4	58	Ogle	45 O.	P.O.J. 2878	Three four by four Latin Squares	0.041	28.VII.34		—	—	2.X.34[1] 8.I.36[2]		23.X.35[1] 6.X.36[2]
B 4	80	,,	45 O.	P.O.J. 2878	A five by five Latin Square	0.042	28.VII.34	3.VIII.34[1]			—		22.X.35[1] 7.X.36[2]
A 13	76	Wales	9 C.	Diamond 10	A five by five Latin Square	0.051	24.II.34	28.II.34[1,5]	18.V.34[1,5] 26.III.35[2,5]		18.V.34[1] 26.III.35[2] 1.IV.36[3]	June 1933 to January 1934	16.III.35[1] 4.III.36[2] 23.II.37[3]
A 11	73	Uitvlugt	31 E.	P.O.J. 2878	Three by three by three Factorial	0.034	22.II.36	24.I.36[1,5]	26.III.36[1]	23.I.36[1]	24.III.36[1]		17.III.37[1]

[1]Plants. [2]First Ratoons. [3]Second Ratoons. [4]Third Ratoons. [5]Basic Applications.